MAR 22 1922

THE BUILDER
A JOURNAL FOR THE ARCHITECT & CONSTRUCTOR

VOLUME CXXII. No. 4126. *Eightieth Year.*

FRIDAY, MARCH 3, 1922.
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THE BUILDER

A JOURNAL FOR THE ARCHITECT AND CONSTRUCTOR.

WITH WHICH IS INCORPORATED THE "BRITISH ARCHITECT."

VOL. CXXII.—No. 4126. MARCH 3, 1922.

THE HOUSING FAILURE.

As time goes on it is possible that various actions of the Ministry of Health in relation to the national housing programme will be brought to light, but is it certain that the Government or the officials of the Ministry will receive the blame which they have been so anxious to place on other shoulders? It is a piquant situation, as we hinted in our columns a few weeks ago, and we think it would be wise to ascertain first whether a nation's thanks may not be the reward for official incapacity.

The facts are these: The Ministry of Health has failed to erect a large number of houses, which would have represented a loss of, say, £50 on each house annually. Meantime, costs of building have been reduced by nearly one-half, and the daily outcry from leaders of industry and finance is that trade cannot proceed under the heavy burden of taxation. If we look at these matters from a rational point of view we can see that an apology for the failure of the housing scheme may be out of place. If the facts had been thoroughly understood we would have been less surprised to find the Director-General of Housing claiming credit for his financial prescience and wisdom in delaying the Government housing scheme. The failure of the Ministry of Health has not been greater than was expected, and certain definite and satisfactory results have been obtained even if the whole scheme is incomplete. We need not discuss the ethics involved in the making and breaking of Government promises, but we are doubtful whether anyone can assume that the country is sorry that we have not a greater number of expensive houses. If houses are to be sold at half-price, is it not possible to free ourselves of humbug and say we are glad the Ministry was saved from itself? We are aware that certain very definite promises were made at the last general election, and it is quite possible they were made by politicians on our behalf, believing that there were no limits to our patriotism. It is well to remember, however, that when the war was over politicians and citizens alike lost all sense of financial proportion. Huge profits were being made, and if we were pledged to pay much we dreamt of getting more. A pauperised country is now groaning with the weight of its taxation, and is eagerly awaiting relief. When we are told that promises should be kept regardless of cost, that the houses could have been built with the money thrown away in Mesopotamia, we are involved in a hopeless circle. We have to take our politicians as we find them, and it is wiser to keep the fact before us that already we have been committed to an expenditure of, say, ten millions per annum upon houses, while a nation at its wits' end is anxiously awaiting the result of the suggestions for reducing expenditure made by the Geddes Committee.

The Rent Restriction Act automatically made the Government responsible for housing, and the re-discovery of the slums and the expressions of surprise at the number of "C 3" men were wonderful at the time when the recruiting agent was all-powerful. It was a good thing to make a virtue of necessity, and whatever may be said to the contrary the Government housing schemes do represent a great attempt to give better housing conditions. It is strictly accurate to say that the houses could have been built had the Ministry of Health been willing to pay the price. Other people were willing to pay, as the records of building during the past three years will prove. Will the amount of time and money which were spent by officials of the Ministry upon meetings with builders to argue and bargain about costs, which increased with every delay, ever be made public? There are many architects who had clients in the same predicament, but these clients have no regrets about escaping the high costs of buildings which would just have been completed in time for the great trade slump. Surely this is the kernel of the problem: that it is questionable whether it was wise to press forward huge building schemes when the costs of building were high. May we not be sorry that the houses were not built as promised, and glad that we can still build them at a much lower figure? We confess we do not understand the mentality of anyone who refuses to see this point of view, and we must view with suspicion the numerous attempts which have been made by the Ministry of Health to excuse the failure of the housing scheme.

The workman, the builder, and the architect have been blamed in turn, and we have had the Report of the Departmental Committee on the High Cost of Building Working-Class Dwellings as an excuse for failing to build houses. This document itself was a failure; it will remain as a record of the elementary fact that prices of building rose during the boom along with all other trades. We have never understood why it should have been supposed that builders should build Government houses at lower rates than private firms were paying for a similar class of property.

A great deal has been made of the fact that the houses were required for ex-soldiers, but everyone will agree that patriotic sentiments tend to become obscure amidst roaring trade and enormous profits. The fact is that finance has been a dragon across the path of the present Government, and the housing scheme was none other than a problem in finance. The lowering of the Excess Profits Duty one year in expectation of a collapse that did not come, and raising it the following year when it did come, was a double miscalculation, and indicated either knowledge or the lack of it which was bound to destroy the reputation of any department dealing with practical affairs. It is certain that a better understanding of the trend of prices would have dictated a different policy in housing, and it is just possible that the position would have been little different from that which we have now arrived at by compromise and delay.

It is plainly to be seen that the Rent Restriction Act was the root of the trouble. To establish conditions which rendered building an economic impossibility for the individual, and to refuse to pay the prevailing prices as a State, made it certain that the one thing we should not get would be houses. We repeat that there is no reason for the Ministry of Health to apologise for the failure of the housing scheme, but there is every reason for understanding why it did fail. There is so much that is good in many of these housing schemes that we should regret to see it thrown away, and the Government will be guilty of a real failure if it allows this to be done. We fear that the tendency to find any excuse is only to disguise the excuse for abandonment.

NOTES.

The Royal Wedding.

The countless good wishes amongst His Majesty's subjects for Princess Mary on the occasion of her marriage which find no visible or audible expression will be taken for granted, but since the Royal Institute of British Architects was honoured by an invitation from the Lord Chamberlain to the President and Mrs. Waterhouse to attend the ceremony in the Abbey, we must, in recording the fact, join with all His Majesty's subjects in our heartfelt wishes for the future well-being of our popular Princess and her fortunate husband, the Viscount Lascelles.

Housing and Posterity.

Our leading article on housing was written before the publication of the report of the Geddes Committee on National Expenditure. The report confirms our views on the recent controversy on housing. We have consistently supported the Government housing scheme so far as it was based on the belief that a better ideal in housing was something which a nation should not value in terms of money only. From this point of view, if we regard what has been accomplished as a great experiment and object lesson, the value to posterity may be incalculable. Nevertheless, we do reach a point when we have to consider how much longer we can continue to pile up financial burdens. We have to consider the absurdity of supplying houses at a huge loss on the rental when the whole nation is groaning under heavy taxation, and industry cannot provide a living for the occupants. It appears to be a hopeless economic outlook to continue to build houses for unemployed, leaving the taxpayer to find £55 per annum on each house. We spent freely when we had the money; we must modify our views when we cannot balance our domestic accounts. The suggestion of the Committee that the houses should be sold at a loss of 50 per cent. indicates that we have done something for posterity, even if we have not done so much as an enthusiastic and apologetic Ministry would have liked. When the whole conception is seen to be fundamentally wrong from a financial point of view it is idle to discuss the failures in administration; the problem has been handled no better and no worse than we have a right to expect from any Government department. The report of the Geddes Committee confirms our belief that the recent attack made on the architectural p ofession was not only quite incorrect in fact, but was wholly unnecessary.

Examples of Old Pottery.

Government Control of Housing

We are apt to forget that housing has been a Government "control," and we have been taught by experience that a control is a double-edged weapon. The following extract from a Government report on the cost of housing —". . . . financial conditions which rendered any building for speculative purposes quite impossible in any but the most exceptional circumstances"—states only half a truth. It also means that many people who would have been compelled to build and had the means to build were protected by law and preferred to live in someone else's house at a nominal rental. In a sense it was not a question of building for speculative purposes; it became a question of renting for speculative purposes, leaving the Government to build. It is thus in an artificial economic condition caused by a control that we as a nation have to bear the slump in prices which under normal conditions and in other businesses and commodities are carried by the individual. A control is obviously a doubtful method of helping those for whom it is intended, and is clearly a certain method of helping many for whom it was not intended. It is possible to project our minds thus far: That had the Rent Restriction Act not been put in force rents would have soared, causing distress to many unless wages had gone up proportionately. But it is certain that the temptation of high rents would have brought forward many new houses, and the losses which we are facing to-day under the housing scheme would have been on the shoulders of individuals. We do not suggest that this course should have been adopted; we suggest that the stern facts of economics which would have confronted the individual should be recognised by the Government and all who are interested in housing. Out of this great national attempt to provide houses we have, in a large measure, set up a better standard which should be a model for the future. The report of the Geddes Committee will be attacked by many enthusiasts, but surely it is not a problem where success or failure depends on how many thousand houses we have failed to put up at the nation's expense, and it is everything that we should ensure that the advantages of the housing scheme should, if possible, be obtained for future generations.

Housing Costs.

The letter from the Secretary of the National Housing and Town-Planning Council, which appeared in *The Times* recently, calls in question the accuracy of the figures given in the Geddes Report, and once more demonstrates the difficulty of basing any argument upon statistics. The invaluable services which the Council has rendered to the solution of the housing problem lends weight to any utterance from that source. At the same time, the disparity between its figures and those of the Geddes Report is so glaring that it is necessary to find out where the discrepancies arise. The question of the economic rent will remain the outstanding problem of housing in the future, but those who criticise the uneconomic character of Government housing finance should not forget that while the Rent Restriction Act remains in operation no landlord of small house property is receiving anything approaching an economic rental. From the point of view of the national balance sheet the figures for house rental, rural and urban, must be taken as a whole. The rents quoted by Mr. Aldridge are typical of the large urban schemes and work out at an average of about 11s. 6d. a week, which includes a provision for repairs maintenance, and collection. An examination of the official figures as a whole appears, however, to show that the average rental does not exceed 9s. gross, out of which about 25 per cent. is taken by the Ministry for the cost of supervision, repairs, allowance for empties, &c. This leaves the net average rental at 6s. 9d. a week, which is not seriously at variance with the official report, which gives the figure at 6s. 2d. It is to be hoped that 25 per cent. will prove an excessive allowance for maintenance, &c., and any reduction of this figure will, of course, increase the revenue from the houses.

The Subject Matter of Wall Painting.

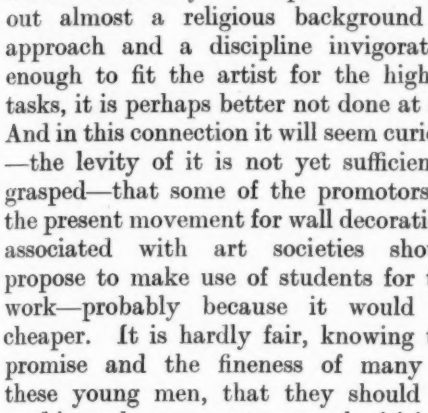
MURAL painting is in its nature unsuited to a trivial subject matter, as we remember to have heard an artist say; one would not expect to see something funny in such a case! It is more properly considered as the epic of painting, through which the noblest ideas may find expression. Without almost a religious background of approach and a discipline invigorating enough to fit the artist for the highest tasks, it is perhaps better not done at all. And in this connection it will seem curious—the levity of it is not yet sufficiently grasped—that some of the promotors of the present movement for wall decoration, associated with art societies should propose to make use of students for the work—probably because it would be cheaper. It is hardly fair, knowing the promise and the fineness of many of these young men, that they should be used in such a way as to compel criticism, which is not against them, but against those who approach the highest matters with such levity, and we believe that many of the students themselves will realise that time will retaliate on them—when other students take their place—and that they will find the work which should belong to their achievement and experience of latter years sacrificed for them. One has only to look round the walls of the Society of Mural Decorators at the exhibition at present being held at the Ashmolean Museum, Oxford (a review of which is given on page 336) to see that there is neglect of the material,—the capable artists—who should be first employed in such work.

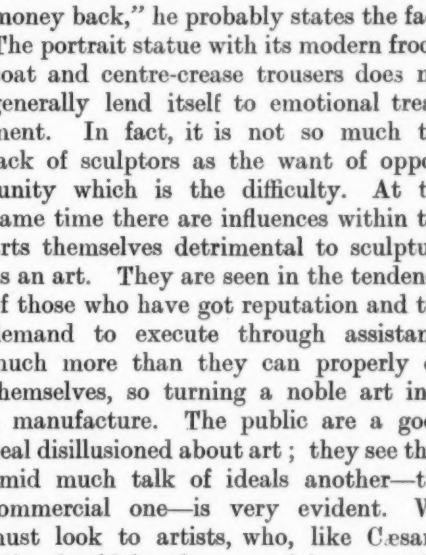
The Neglect of Sculpture.

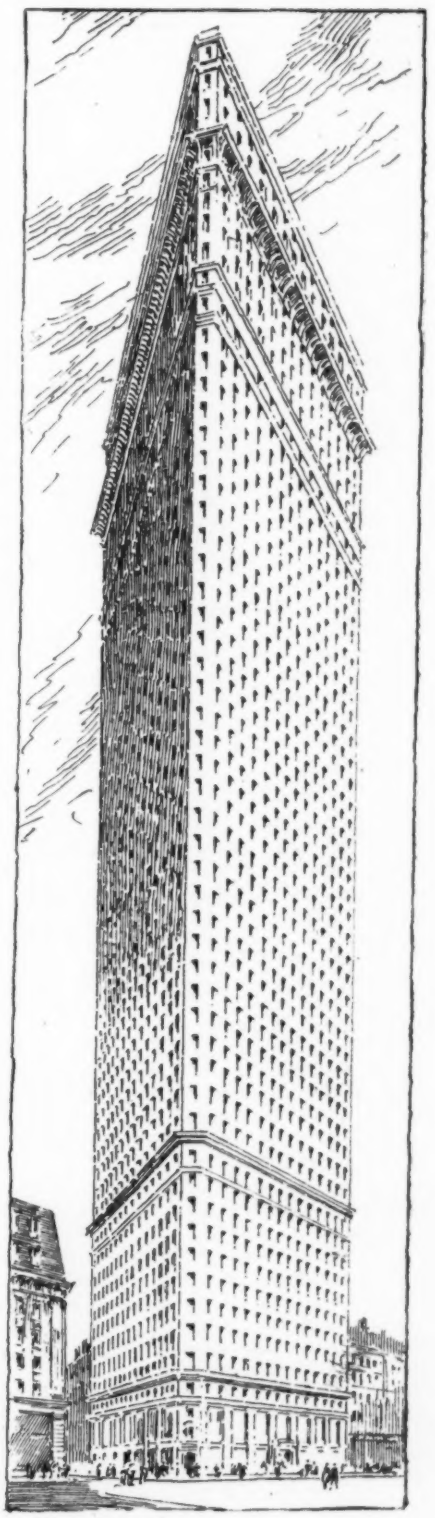
THE letter of Mr. Herbert Hampton arising out of an article in *The Times* on the neglect of sculpture has all the weight attaching to the view of a sculptor who has executed much public work. The "Lord Salisbury" in the Foreign Office, the "Duke of Devonshire" in Whitehall, and the statue of King Edward in Euston-road are well-known examples of his art. When he says that "England almost alone among the countries gives no public encouragement to imaginative work, and if a sculptor does risk the spending of several hundreds of pounds in producing such the chances are remote that he will ever see even his money back," he probably states the fact. The portrait statue with its modern frock-coat and centre-crease trousers does not generally lend itself to emotional treatment. In fact, it is not so much the lack of sculptors as the want of opportunity which is the difficulty. At the same time there are influences within the arts themselves detrimental to sculpture as an art. They are seen in the tendency of those who have got reputation and the demand to execute through assistants much more than they can properly do themselves, so turning a noble art into a manufacture. The public are a good deal disillusioned about art; they see that amid much talk of ideals another—the commercial one—is very evident. We must look to artists, who, like Cæsar's wife, should be above suspicion, to resist this commercialism which has invaded art and to purify it from a traffic which has lowered it in the eyes of the public, and which is bad citizenship as well.

Proposed Higher Buildings for London.

THE question of the desirability or otherwise of allowing buildings of a greater height than that permitted under the London Building Act to be erected in London has received much attention recently, and will, no doubt, be the subject of much further discussion. Following the report of the London Building Act Committee of the R.I.B.A. (see our issue for February 17 for abstract), the meeting of the Institute called for Monday next for the discussion of the subject should lead to a free interchange of ideas as to the suitability and necessity for an increased height. In order to assist the discussion, we give on page 333 an article which we have received from Sir Henry Tanner, a supporter of the movement for increased height and a member of the R.I.B.A. Committee which has recently reported, and on this page we give Mr. Delissa Joseph's drawing which *The Times* recently published in explanation of a letter from him which our contemporary printed. These drawings represent an 80 ft. building, a "higher building" of 150 ft., and a "skyscraper" of 600 ft., each founded upon an identical site having 100 ft. frontage to a park and 100 ft. return frontage to a street 50 ft. wide, the object of the drawings being to illustrate the difference between a "higher building" and a "skyscraper," and thus, to quote Mr. Joseph, "to remove the erroneous impression that the former is the latter."







Proposed Higher Buildings for London. From a drawing by MR. DELISSA JOSEPH, F.R.I.B.A.

GENERAL NEWS.

Professional Announcements.

Mr. Wilfred Travers, O.B.E., F.R.I.B.A., who practised before the war at 33, Old Queen-street, Westminster, and at 7 and 9, The Broadway, Hammersmith, has recommenced private practice at No. 8, Bedford-row, W.C.1, and would be glad to receive trade circulars and catalogues at that address.

Mr. R. Grierson, A.M.I.E.E., A.M.I.Mech.E., for twelve and a half years chief electrical and mechanical engineer to Provincial Cinematograph Theatres, Ltd., and its associated companies, has resigned his appointment in order to take an active interest in a new contracting firm, details of which will be available shortly. His address is c.o. 197, Wardour-street, London, W.1. (Telephone, Regent 2226.)

School of Hygiene for London.

The Minister of Health, on behalf of the Government, has accepted an offer of the Rockefeller Foundation to erect and equip a School of Hygiene in London. The Rockefeller Foundation has offered to provide a sum of $2,000,000 towards the cost.

"Architects' Olympian Night."

By the invitation and assistance of Mr. H. Greville Montgomery, the Architectural Association is organising a fancy dress ball and carnival in the Conference Hall at Olympia on April 21. There will be a carnival procession illustrating "Brighter Building Stunts," which will parade the Building Exhibition at 9 p.m., previous to the ball, which will continue until 5 a.m. All the proceeds will be devoted to the A.A. Endowment Fund. Application for tickets should be made to the Secretary, Architectural Association, 34, Bedford-square, W.C.1.

Thirteenth-Century Crypt Discovered.

Workmen who were digging out the foundations for a garage at Reigate have discovered a 13th-century crypt or dungeon. This was formerly under the original Market House, which appears to have been demolished at the Reformation, when Henry VIII abolished the pilgrimages to the shrine of St. Thomas a Becket at Canterbury. The crypt is being restored, and will be opened to the public. The building is constructed of local stone, with heavy vaulted ribs, windows, and portions of the original stone steps.

Obituary.

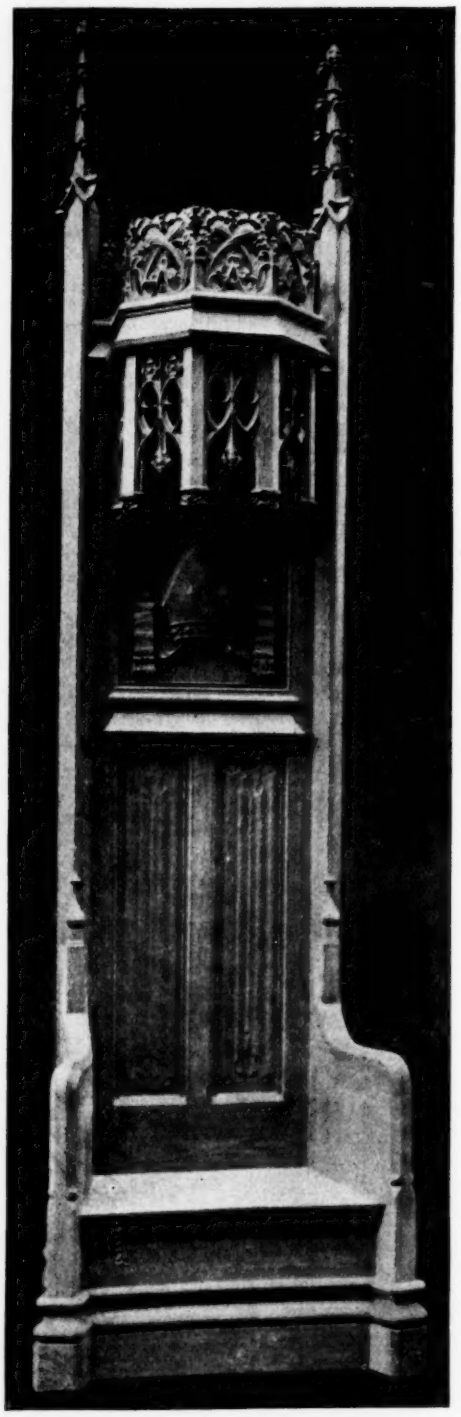
Mr. S. Cym Jones, senior partner in the firm of S. Cym Jones & Arnold, architects, Neath, passed away on Monday last week. He had been a Justice of the Peace for Neath for the past five years.

The death of Mr. A. J. Saise, a well-known Bristol surveyor and civil engineer, occurred on February 21. For eight years Mr. Saise was Surveyor to the Stapleton District Council before that district was brought within the city boundaries. Later he became Surveyor to the Kingswood Council, and after resigning that position he set up business for himself in the city. He was a member of the local bench of magistrates, and served two periods on the Bristol City Council.

The death has occurred of Mr. Thomas Marshall Smith, A.R.I.B.A., of Crouch Hill, N.

The British Electrical Development Association.

On Wednesday last week the British Electrical Development Association held a luncheon at the Hotel Cecil, under the chairmanship of Mr. E. C. Ransome (Chairman of Messrs. Ransome, Sims, & Jeffries, Ltd., of Ipswich). The toast of "Electrical Progress" was proposed by Mr. Atkinson, and responded to by Mr. Arthur Neal, M.P. (Parliamentary Secretary of the Ministry of Transport), who said the Electricity Act of 1919 was an effort—and he thought it would prove a successful effort—in the abolition of waste. That Act, establishing the Electricity Commissioners, was a step in the direction of securing two things: first, that there should be a mapping-out of the whole country into suitable divisions; and, second, that there should be no central control, but local autonomy. That plan was working out with much greater goodwill than anyone could have foretold. The problem of London was practically settled. Loans had been sanctioned to the extent of £28,000,000 for local authorities, and works were proceeding.—Other toasts were "The Electrical Industry," proposed by the Chairman and responded to by Mr. J. S. Highfield (President of the Institution of Electrical Engineers), and "Our Guests," proposed by Mr. A. F. Berry and replied to by Sir Archibald Denny.



Bishop's Throne at St. Alban's Church, Teddington.

Mr. Leonard Martin, F.R.I.B.A., Architect.

[Executed by Messrs. John Daymond & Son, Ltd., of London.]

EXHIBITION NOTES.

THE FINE ART SOCIETY.

Some passages of charming colour are to be found amongst the water colours by Cecil A. Hunt, A.R.W.S., at the Fine Art Society, and good atmospheric effect in all of them. The "Gravesend Reach" (17) is an admirable drawing of quite decorative quality—a touch of black, yellow, and grey. It might be called the apotheosis of smoke, for surely the world would miss an element of beauty if all these pleasant smoke effects were banished. There is a pleasant breadth of quiet tones of colour in some of the drawings which is very pleasing, as in "The Ruin" (23), "Sussex Downs" (30), and "Chalk Downs" (34). There is another drawing of quality in smoke, called "Riverside Works" (45).

THE LEICESTER GALLERIES.

The twelfth exhibition of the Senefelder Club suggests how much more interesting it would be if technical accomplishment were more frequently united to charm of subject. For technical values Forain, Steinlin, Rothenstein, Pennell, Shannon, and others, afford us real satisfaction; but it is in such drawings as "Durham from Observatory" (91), by Anthony Raine-Barker, that we find the complete delight of a beautiful subject set forth with adequate skill and a quiet breadth of effect which is really satisfying. This artist generally succeeds in the twofold value, as we note in "The Turn of the Plough" (96), and Nos. 99 and 100. The pathos that finds such telling expression in French art and letters is well expressed in Steinlen's "Fête Nationale" (18), showing the real stolid life of the man with two children, with the charm of a masterly handling. There is more than enough of vulgar and childish work in the exhibition to act as a foil to the real artistry of such things as Claude Shapperson's "Motherhood," Harry Becker's clever sketches (36 and 72), pleasing subjects by Chas. Shannon, J. McLure Hamilton, Emile Claus, and G. Spencer Pryse. There are small things by Whistler, and other well-known names appear in the catalogue. Altogether it is hardly a notable exhibition.

We step into a world of ideality amongst the pictures by Mr. William Shackleton, but "The Song of the Evening" (1) gives an impression of quality which is not borne out by the rest of the work. The ability shown in the pictures is undoubted, but one feels that there is a lack of restraint and a theatrical artificiality about them which is unworthy of the artist's powers.

WALKER GALLERIES.

An attractive title is the "Cottage Home and Heaths of Dorset," by W. W. Collins, R.I. We hope the change in estate ownership will not lead to the loss of many of the charming old buildings the artist's drawings typify. On the whole, we prefer Mr. Collins' cottages to his heaths. But that criticism does not apply to the delightful little drawing of "Corfe Castle from Arne" (16), or the sparkling "Poole" (48), or the admirable sketch, "A Road Across the Heath" (52), which give us the true quality of water colour. The pictures generally suffer from over-accentuation, as though the subject were "on show." This does not apply to such things as "Barneston, a Purbeck Manor Farm" (9), which gives us the beautiful grey tones of the old home in a broad and unobtrusive manner. Most of the cottages illustrated are, however, of a type we cannot repeat to-day, because of our better views as to light and air.

Examinations in Art, 1922.

We have received from the Board of Education the Rules and Syllabuses for Examinations in Art, 1922 (London: H.M. Stationery Office, Rules 110, price 3d. net). Provided the number of candidates in the several subjects is sufficient, examinations, based upon the syllabus published in Appendix I, will be held in drawing, painting, modelling, pictorial design, and industrial design.

CORRESPONDENCE.

Registration and Unification.

SIR,—Mr. Keen writes, "There is every prospect of the Council's actual proposals in the matter of unification being laid before the members of the R.I.B.A. long before the next general meeting, for consideration of the matter." As a constant attendant at the Council meetings, this is the first I have heard of it! Mr. Keen will correct me if I am wrong, but my recollection is that the above subject had never been considered by the present Council until Monday last. At that meeting it agreed with the resolutions of the Unification and Registration Committee, and in doing so it acted directly in opposition to the opinion of the general body, which by a majority of nearly 33 per cent. was in favour of the following resolution: "That this meeting is of opinion that the conditions for the unification of the profession should form part of a Registration Bill, and that the present system of admittance to the Institute, including compulsory examination, should continue in force until a Registration Bill be passed."

Again, Mr. Keen wishes us to pause "until the scheme of the Council in detail is published." I repeat, without fear of contradiction, that the Council has no scheme, and has not even discussed a scheme.

Now, as to the chances of obtaining a Registration Act: the opinion of any architect would carry no weight, we must be guided by experts. Messrs. Sherwood wrote that in their opinion it would "be impossible . . . to obtain legislation on the lines proposed." I enclose a copy of the whole Report.

Mr. Keen again gives his interpretation of the first resolution of the Unification and Registration Committee, and contends that only selected and approved architects are to be admitted to the R.I.B.A. If so, why call the scheme "unification"? He wants to do business under a false trade-mark.

The R.I.B.A. Defence League has been blamed for not waiting for the report of the Unification and Registration Committee before calling a meeting to consider the matter. But that Committee has published four important resolutions, and they were considered and voted on by the Council last year; surely the general body could not do better than follow the example of the Council, and consider and vote on those resolutions: The general body has done exactly what the Council did, but it has come to an exactly opposite conclusion.

Now, let us suppose the general body had done nothing until the publication of the full scheme. I submit it would have rendered itself liable to a severe, and perfectly justifiable, reprimand; the advocates of the scheme would have said, "See what you have done; you had four fundamental resolutions before you, say, two years or more ago; you knew perfectly well what was intended, no objection was taken, and the Unification and Registration Committee has proceeded exactly on those lines and formulated a complete scheme which is laid before you after hard work for many months. And now at the last moment you want to object and upset all their work; if you objected to the proposals in the resolutions, why on earth did you not say so when they were published"! &c., &c. The defenders of the scheme do seem hard up for arguments, don't they?

Every member of the R.I.B.A. who is in favour of the resolution submitted on the 7th instant and quoted above should join the R.I.B.A. Defence League; that resolution embodies all our views. We do not object to registration, and we do not object to unification; any Fellow or Associate sending me a postcard would be enrolled as a member. There is no subscription.

Guildhall, E.C. SYDNEY PERKS.

The Cost of Government Houses.

SIR,—I am somewhat surprised that in your Note on the cost of Government housing, in *The Builder* for February 17, you appear to accept the statement that the average cost of each house will probably work out at £1,100. Doubtless this statement was given to the Geddes Committee by the Ministry of Health; but is it more than a guess? For reasons sufficiently set out in your Note, prices were unduly inflated, but it is difficult to believe that the average cost of all the houses erected can be £1,100.

Last week Sir Alfred Mond is reported to have given the following figures in reply to a question in the House. The average tender prices approved by the Ministry for houses were: Prior to June 30, 1921, £815 and £967 for non-parlour and parlour houses respectively; for the period June 30 to December 31, 1921, £593 and £684; and during the current year, £478 and £534.

Builders who have had during the past three years to listen to many uncomplimentary comments on their share in the housing scheme should be interested in getting the two statements reconciled.

London. EDWIN AIREY.

[***We accepted the figure £1,100 as the average cost of each house to the nation because this figure includes not only the cost of the house itself but the purchase of the land, cost of roads and sewers, architects' fees, and similar disbursements. Sir Alfred Mond's figures quoted above refer to house tenders and consequently do not include these items, and take no account of the higher prices that ruled in 1920; last week Sir Alfred Mond stated in the House of Commons that the average all-in cost of houses built before June, 1921, was about £1,100—the figure we mentioned.—ED.]

Specifications.

SIR,—Referring to the editorial in your issue for February 17, under the head of "Specifications," we think if you would make inquiry among quantity surveyors of repute you would find that the following items always receive their most careful attention:—That the drawings are workable in every detail; that the specification is made to agree with the drawings and quantities; that the contractor is never expected to take unnecessary risk in pricing any item; that every item in the bill is so described that an accurate price can be given; and that "every omission, every ambiguity" in the specification is properly dealt with by the quantity surveyor before the quantities are sent out to tender.

London. C. JOHN MANN & SON.

Amateurs in Cottage Building.

SIR,—In the correspondence aroused by the straight talking of Sir Charles Ruthen so much ink has been spilt that perhaps a few extra drops from my pen may be excused. By now Sir Charles will have discovered, if he did not previously know it, that presidents of societies, as well as ordinary everyday folk, if they wish to please their associates, must not state unpalatable truths. But, quite apart from that, the letters in your pages from indignant architects are, in many cases, quite amusing. More than one writer states as an incontrovertible fact that it is cheaper to build twelve houses to the acre than twenty, and that when houses are semi-detached they are built as cheaply as when built in blocks of four; whereas it is quite untrue, and always will be. For pure unadulterated arrogance the statement that "the speculating builder felt, not without reason, that the gulf of intellectual and professional superiority was such that it was useless to attempt to seek advice from those most qualified to give it" is really peerless. There is not the least doubt that, in the great majority of cases, the architects of many housing schemes were, to all intents and purposes, amateurs in cottage building, and they have simply been serving a well-paid apprenticeship—at the public expense.

In other letters appearing in your pages, it is hinted that new schemes of housing may be carried out by the Office of Works "without the assistance of architects." That is a nasty one for H.M.O.W.; all the shrewder because of its unconscious satire. But the idea that some of the officials of that department who have carried out schemes have been, not too efficient, and that theirs has been only a "'prentice hand," is not ill-founded. The plans of many of their cottages, especially of that part of the house where the greater part of the household work has to be done, were distinctly inferior to many produced by the much-derided speculative builder.

In addition, the ideas of economy held by H.M.O.W. were rather curious. A mania for machinery and light railways seemed to exist. No matter what the site, flat or mountainous, it was all the same. The theory was to form "a dump," and have light railways all over the place to distribute the material. To anyone possessing the most elementary knowledge of "scattered" work and the increased handling of materials occasioned by such methods, the idea was wrong for any site, and when employed for mountainous sites, such as in South Wales, was absolute folly. But it was persistently followed! Concrete mixing by machinery was also a great idea. In one case in South Wales the manager was pressed to use a mixer which had been sent to the site. When he pointed out that it would not be economical to use it he was told "to bring it into use and *cut the loss*." In the interests of public economy he still declined to use it, but this did not end the matter, for so-called tests were made on another site and, as a result, it was found that the cost of mixing and spreading machine-made concrete was nearly 25 per cent. more than the cost of that carried out by hand on this particular site.

On another occasion two men were running around the district for a week to ascertain the position of stocks, and if any difficulty was being experienced in obtaining supplies. Even in these days of the "twopenny post," this seems an extravagant method of obtaining information of such a nature. But within a week two more men were round on precisely the same errand. This, of course, in addition to the usual stream of officials. In spite of all this attention (?) it often took many weeks for a "requisition" to be converted by headquarters into an "order," and even then, in the case of joinery, &c., the goods had to be manufactured. (I am speaking of the second half of last year, when plenty of material was available.)

In other ways, too, the amateur hand was evident—one instance being a mongrel Yorkshire range of which "the Office" was inordinately proud. It had closed brickwork flues with dampers and an open fire, so that it was very efficacious—as a fumigating apparatus.

This does not exhaust the list of "economies," and "improvements." Many more could be cited. All things considered, it is to be hoped, therefore, that the Office of Works may not be entrusted with more housing schemes. We shall probably be better served by "real architects," especially with their newly-acquired experience.

Eastbourne. W. A. KNIGHT.

Columns on Greek Temples.

SIR,—With regard to the columns on the flanks of peripteral Greek temples there is, as you know, generally an odd number, while on the front there is an even number of columns. Why is this? My theory is that the eye looking in elevation on the long range of columns is "caught" by the odd one in the centre and then directed to the two even groups on either side. Is this so? Perhaps some of your readers or Professor Lethaby will explain the reason for this peculiarity.

R. BOYD-BARRETT.

The Labour-Saving House.

SIR,—I have read with interest Mr. Jollye's letter which appeared in your last issue. It is clear that this gentleman has overlooked my letter

published by you on February 3rd, in which I made it clear that I had taken my aspect points from the perspective as illustrated If Mr. Jollye is correct, which can only be proved by the publishing of the lay-out plan, we should find the dining-room to the east, with nothing but early morning sun; the drawing-room to the south-east would have sun only until about half-way through the afternoon; and the loggia would be facing directly to the east. I think it can be fairly assumed that the designer intended the dining-room and loggia to face south.

If Mr. Jollye will also refer to my letter to which he was replying, he will find that I have no quarrel with the size of a family. I merely state that my contention is that to-day a house costing £2,000 to £2,200 should have seven bedrooms, &c. I have always found that people of the professional class delight to have their friends around them and rejoice in having sufficient spare accommodation.

I do not agree with Mr. P. G. Hayes that lady architects are the solution to the domestic side of the situation. I think that too often the architect hears the lady client's requirements and ignores them when her ideas could be embodied with advantage.

London. Reginald C. Fry.

A Mid-Metropolitan Traffic Artery.

Sir,—Twelve months ago I mooted the above in your columns, remarking that the key to the scheme (the site of Devonshire House) was in the market for building purposes. It still is, and it is on that account I am addressing you.

May I further suggest that some public or semi-private body, say, like the Brighter London Society, take the matter up, add to its objects, seek incorporation, prepare a scheme, and proceed on its way as *the* authority for "London Traffic Improvement" in conjunction with private owners.

The two moving spirits, as announced in *The Builder* lately, should be able to guide successfully, along with others, any movement to make London (provisionally at least) "the magnet of the world," as they have phrased it.

"O. B. I. T."

Other Letters.

Other letters are given on pp. 335 and 248, and some are unavoidably held over.

COMPETITION NEWS.

Stirling.

A meeting of subscribers to the Stirling war memorial has agreed to ask local architects to send in designs for the site in Corn Exchange-road, opposite the Campbell-Bannerman statue. The subscriptions received amount to over £2,500.

Trujillo Statue of Liberty.

As this competition appears to be intended rather for sculptors than for architects, the warning notice of the R.I.B.A. has been withdrawn.

Other Competitions.

Other competitions still open include the following (the dates given are, first the sending-in date, and second the issue of *The Builder* in which full particulars were given):—Auckland war memorial (June 30; Sept. 2, 1921); Trujillo (Peru) monument (June; Jan. 13); Dundee War Memorial (April 30; Jan. 6); Colour Competition (May 1; Feb. 17).

Southend-on-Sea War Memorial. Sir Edwin L. Lutyens, R.A., Architect.
[This memorial was unveiled on November 27 last.]

ARCHITECTURAL SOCIETIES.

NORTHERN ARCHITECTURAL ASSOCIATION.

ADDRESS BY MR. PAUL WATERHOUSE.

On February 21, Mr. Paul Waterhouse, M.A. (President of the Royal Institute of British Architects), paid a visit to Newcastle to address the members of the Northern Architectural Association. In order to celebrate the event Mr. T. R. Milburn (President of the Northern Association) entertained members of the Council to dinner, in order to meet Mr. Waterhouse prior to the general meeting which was arranged for the evening. At this preliminary gathering, Mr. Milburn took the chair, and amongst those present were the Lord Mayor of Newcastle, and Messrs. W. Milburn, A. B. Plummer, R. Burns Dick, J. T. Cackett, W. J. Jones, G. H. Grey, G. Reavell, F. N. Weightman, G. E. Charleswood, C. S. Errington, P. L. Browne, J. Hall, and Mr. G. T. Brown (Honorary Secretary).

The toast of "The Newcastle Corporation" was proposed by Mr. Waterhouse, who congratulated the civic body on having the charge of such a fine city, and was replied to by the Lord Mayor.

There was a large gathering at the general meeting later in the evening, Mr. T. R. Milburn again occupying the chair. In introducing Mr. Waterhouse, Mr. Milburn said a visit from the President of the R.I.B.A. marked an epoch in the history of the Northern Architectural Association. Lately much had been said with reference to unification of the R.I.B.A. and allied societies, and following upon his predecessor in office (Mr. Simpson), no one had done more to secure that than Mr. Waterhouse had done. Since the allied societies represented about 3,500 members out of 4,500, they were probably more important than any other section of the profession. Although the members of the Northern Association were not all members of the R.I.B.A., everything was leading up to that. Never had there been better feeling, or closer touch between members of the profession, than that which had been brought about by the visits of Mr. Waterhouse to the country members.

The meeting was then addressed by Mr. Waterhouse, who said it was a great pleasure to visit the allied societies, because there was an especially strong brotherly feeling between architects in London and those who belonged to allied societies outside London. He thought the non-Metropolitan people had not always understood how much they were appreciated in London, and London members had not always realised what they derived from the friendship of the allied societies. The strength of the Institute was not centred in London, but in the vast group of men who represented the interests of architects throughout the world, and not only in England. So much had the Institute grown that it had become imperial, and it had societies in every quarter of the British Dominions—India, Canada, Africa and Australasia—and in the outlying places of the universe, such as Hong Kong. The Institute was without doubt the finest architectural society in Europe, and its growth had brought responsibilities to those associated with it. There was perhaps nothing within the purely British sphere of the Institute which had shown the solidarity and brotherhood of the corporate body more clearly and definitely than the movement towards unification. Some misunderstanding had existed about the scheme, and it was his desire to make it quite clear that it was not a scheme commenced by a faddist in London, or that it was fostered by the Council in London. The scheme had its origin amongst the general body of the profession. In his opinion, unification was a very fine thing, despite the fact that the scheme might be complex and might involve the sacrifice of some principles. It was the right of anyone to express an opinion, but he felt the critics of the unification scheme had launched their criticisms before the scheme was born, and he therefore proposed with the approval of the Council shortly to issue a statement on the whole movement. It was his duty as President, whilst holding definite views on unification, to see that the prestige of the Institute was not in any way let down; that no class in the Institute was prejudiced beyond the extent demanded by the spirit of sacrifice. Whilst something had to be given up, it was his duty to see that the something was not excessive.

The President next turned to education, and expressed appreciation of the progress made so far as architects were affected. A point seldom realised was how much was owed to the fathers and grandfathers of the present generation, who under the pupilage system accepted fees and received free service but gave a good grounding in the profession. No scholastic course could take the place of office experience, but the profession must be grateful for the fact that the pupilage system was terminated. He quite appreciated how much had been accomplished in Newcastle in the direction of education, and congratulated the Northern Association on the recent success and official recognition of the Architectural School at Armstrong College.

In conclusion, Mr. Waterhouse said the general architecture of Newcastle was on a scale of magnificence hardly to be equalled in other towns in Great Britain, and the duty of the younger members of the profession was to maintain Newcastle's high standard.

Moving a vote of thanks to Mr. Waterhouse, Mr. W. J. Jones (Past-President of the Northern Association) said he thought they in the North of England were thoroughly in favour of unification. Through the Institute the public could realise that the architect had a thoroughly good education, and he thought through a system of unification the profession could assure the public that the men engaged in it were worthy of attention.

The vote was seconded by Mr. A. B. Plummer (Senior Past-President), who said he realised the immense importance of uniting themselves more closely together than in the past. The Northern Association, like the majority of associations throughout the country, had always been in favour of unification.

Supporting the vote of thanks, Mr. C. S. Errington (Past-President) said he was heartily in favour of unity, and any sacrifice called for in that cause should be made. Messrs. R. Burns Dick, L. W. Taylor, and G. C. Charlewood all spoke in favour of the movement.

Mr. G. T. Brown (Secretary) also supported the motion, which was heartily accorded, and briefly replied to by Mr. Waterhouse.

Mr. Weightman, of Armstrong College, afterwards gave a short address to the students on architectural principles.

LIVERPOOL ARCHITECTURAL SOCIETY.

COLOUR IN ARCHITECTURE.

Mr. E. R. F. Cole, Lecturer in Decoration and Design at Liverpool University, in a paper on "Colour and Architecture," read before the Liverpool Architectural Society last week, said gaudiness was not a necessary accompaniment of the use of brilliant colour on the exterior of buildings. The use of colour was an instinctive impulse with all peoples that possessed a native art. Architectural polychromy necessitated the employment of full, brilliant colours properly and scientifically used on small surfaces, and of paler colours on the larger surfaces. A fault of the work of the present day was the tendency to use full colours on large surfaces, thus killing the effect aimed at. It was only with the growth of industrialism that colour had practically disappeared in architecture, largely owing to the smoke nuisance, coupled with adherence to a tradition which neglected the fact that colour was used in the old days. The increased interest taken in the matter in recent years was a hopeful feature; but colour was at present being used without that special study of technique which was essential if good results were to be secured. So long as the smoke nuisance remained, colour in architecture could only be achieved by the use of permanent materials that could be washed, such as a covering of fusible glass, coloured terra-cotta, and artificial stone and concrete, in which the colour could be integral.

At the close of the meeting, the President (Mr. Gilbert Fraser) tendered the congratulations of the Society to Professor Reilly (Head of the School of Architecture at Liverpool University) on the fact that eight of the nine candidates selected for the final competition for the Rome Scholarship in Architecture were students of the Liverpool School.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

MICHELI SAN MICHELE.

The ninth general meeting of the Birmingham Architectural Association was held at the Birmingham School of Art on February 24. Mr. H. T. Buckland, F.R.I.B.A., occupied the chair; and Mr. H. Worthington, M.A., A.R.I.B.A., gave an illustrated lecture on "Micheli San Michele, of Verona."

After a few introductory remarks, Mr. Worthington spoke of the danger of blind enthusiasm for a past style unless tempered by critical historical study, and said the best way to study a period was to specialise on a man. San Michele was a typical child of his age, with a passion for Roman antiquity, yet he faced the needs of his day, and in his fortifications adapted the needs of modern military engineering to meet the developments of modern artillery. He recast the planning of town and country houses to meet a growing sense of security in city life. One of the last of the Renaissance giants, he summed up the period of culmination, and showed traces of the coming decadence. In character, San Michele had the enlarged outlook of one who constantly associated with great men. He was a loyal citizen, a staunch servant of the State, and a devoted friend. He practised in the same manner as modern architects, and had his share of awkward and exasperating clients.

Mr. Worthington showed many slides illustrating the walls and gates around Verona, the fortifications at Parma and Piacenza, and the Fort of S. Andrea, carried out by San Michele, and concluded with a descriptiono f his characteristics.

Mr. E. F. Reynolds, F.R.I.B.A., proposed a vote of thanks to the lecturer, which was seconded by Mr. B. J. Fletcher and carried unanimously.

THE INSTITUTE OF SCOTTISH ARCHITECTS.

A meeting of the Council of the Institute of Scottish Architects was held in Edinburgh last week, Mr. A. N. Paterson presiding.

The Education Committee submitted a report on the negotiations which had taken place with Glasgow University and the Royal Technical College towards the institution of a degree in architecture. From communications received from these bodies it is hoped that such a degree may be established in that centre, and that the same course may ultimately be adopted by other Scottish Universities.

A letter was submitted from the R.I.B.A. on the proposal to formulate a new building code for the country in general, and asking co-operation. It was decided, while agreeing to co-operate with the Royal Institute, that, in view of the difference in building practice and law in Scotland, it was desirable that separate action for that country should be undertaken by the Scottish Institute.

The annual convention is to be held at Inverness on June 16,

HIGHER BUILDINGS.

BY SIR HENRY TANNER, C.B., I.S.O., F.R.I.B.A.

The question of fixing the limits to the height of buildings in London has for years past exercised the minds of many architects whose practice is chiefly concerned with commercial premises, and consequently the limits of cube and unobstructed floor area in the case of buildings used for the "storage and sale of goods of a non-fire-resisting nature." Public attention was drawn particularly to the height allowed for buildings by Mr. Delissa Joseph in letters to *The Times* and papers read before several bodies, and in consequence the Royal Institute of British Architects appointed a Building Acts Committee in July, 1920, to "consider and report upon the reform of the London Building Acts," and in November of last year the Committee submitted an interim report on the above questions, but deferring to a further report other matters which required consideration and modification.

Having obtained the views of the Standing Committees, the Council arrived at certain conclusions, and these appeared in the public Press on Christmas Day and subsequent days, but no intimation was given to the Committee till December 29, when the Committee was informed that the Council had decided to adopt the report of the Art Standing Committee, which was, however, misleading, because the report adopted and published was the minority report of the R.I.B.A. Committee, consisting of one gentleman, as opposed to the remainder of the Committee present on the occasion, numbering eleven. On January 23 the Council resolved that the Committee be thanked for its services and formally discharged, evidently showing that the Council was dissatisfied with the report, and its unwillingness to receive any further observations on either the above points or other matters.

With regard to the merits of the question it may be interesting to recall the various changes arising out of the several Acts which have been obtained governing buildings under the Metropolitan Board of Works and the London County Council. Up to 1890 there was no limit imposed on new buildings in existing streets, but in that year an Act was obtained which limited the height to 90 ft. and two stories in the roof and the cube to 450,000, and introducing for the first time a limit of height of 60 ft. to the surface of the top floor when the cubic contents exceeded 250,000 ft. This Act was superseded by that of 1894, when the height was reduced to 80 ft. and two stories in the roof; the height of 60 ft. was not mentioned, and the cubic contents put back to 250,000 ft. But later, in 1908, another Act was obtained which, while referring to the above figures, gave the L.C.C. a free hand to assent to whatever excesses on these heights and cubes it felt justified in allowing, and also the cube might be calculated horizontally between two imperforate floors, assuming that these were fire-resisting.

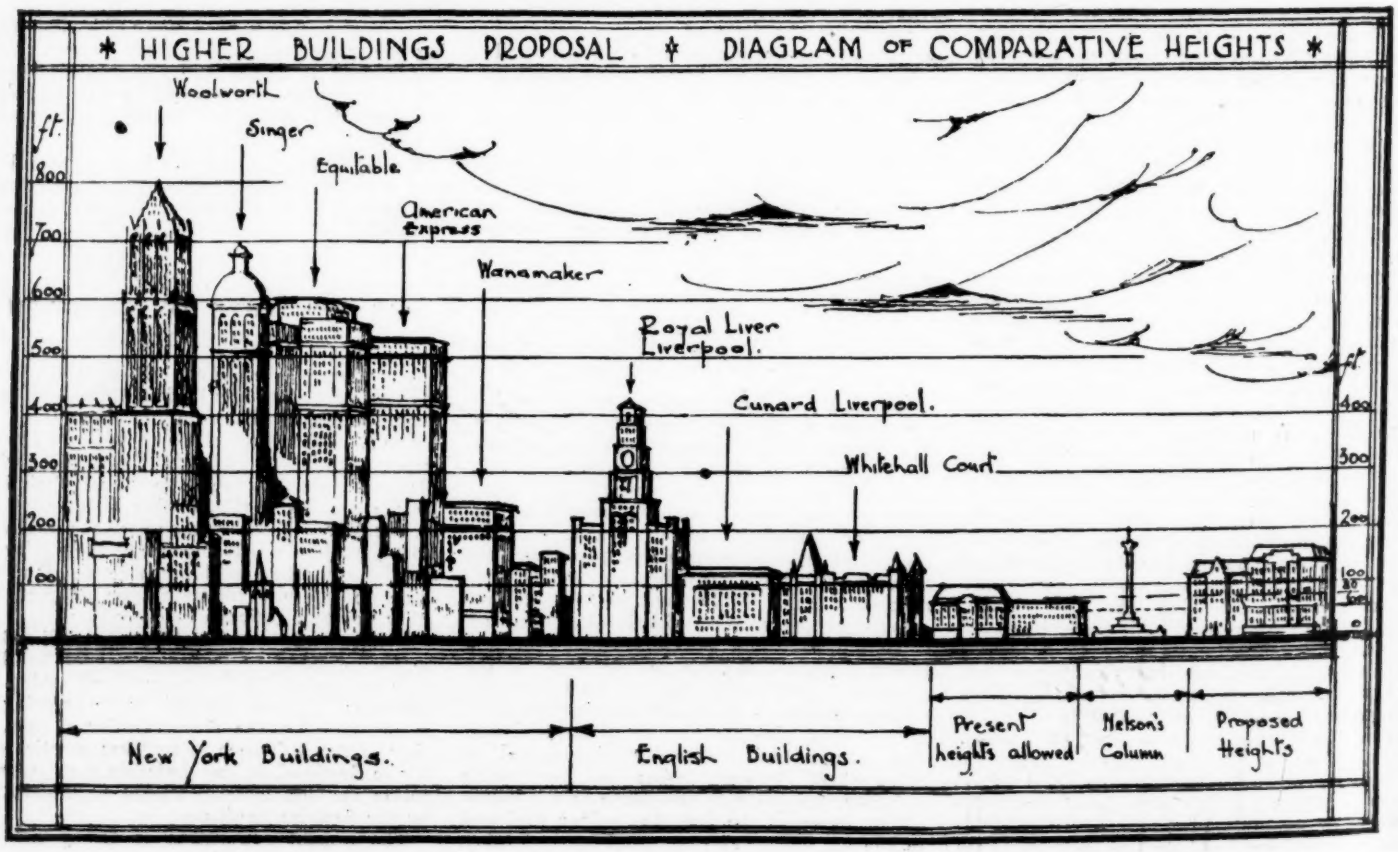
Following this Act of 1908, Regulations were published laying down the conditions under which a larger cube might be granted, reaffirming the heights that would be assented to, and limiting the floor area of each cell to 20,000 ft.

It will therefore be noted that although the construction of buildings has made great advancement since 1890, and particularly their increased fire-resisting capacity, the action of the London County Council has been of a retrograde character, and when any concession is desired by way of greater cube there is an unreasonable limitation of height which is a matter of great importance to that somewhat limited class of large-store proprietors who are chiefly affected.

No doubt this view is governed by fire-fighting considerations, but inasmuch as heights of 80 ft. and two stories in the roof are authorised by the Act and numerous buildings are erected to these limits it is difficult to understand why these buildings of larger cube are treated in a special manner, particularly as they are more efficiently equipped with fire-extinguishing appliances than buildings in general, and it is very difficult to understand why the London Fire Brigade endeavours to persuade itself that it is less efficient than its confrères in various parts of the country. This reduction in height gives rise to a loss of floor space of some 30 per cent., which is a matter of extreme importance having regard to rents and the cost of building. The enlargement of floor areas would not affect the insurance, because the companies do not give any consideration when the spaces are connected by openings, although these are provided with double doors; while the losses sustained in buildings where automatic alarms are installed are stated not to exceed 2 per cent. of the premiums paid, and as these alarms are usually required, it would seem that the danger and loss arising from fires are extremely small. Perhaps the report of the Royal Commission on Fire Brigades may throw some light on the matter, but the position taken up by the London County Council is not intelligible at present.

It is true that a concession has been recently announced—that the Council has authorised in the case of buildings used for trade purposes as defined above an extended limit of 80 ft. to the ceiling of the top floor—but the gain is more apparent than real. As a rule the heights of the floors, surface to surface, cannot be less than 14 ft. to 15 ft.: therefore the top story brings the total height up to 75 ft. or thereabouts, from which it will be seen that the concession is futile in such cases, there being only a margin of about 5 ft. for the additional story. Of course, there are cases where this can be obtained, but only by cramping the lower floors. The Council would show itself appreciative of the circumstances of these large ratepayers and taxpayers by not discriminating between one class and another, but allowing all buildings to go to whatever height may be ultimately decided upon. With imperforate floors it would appear from experience that fires can be equally well confined to horizontal cells as in the case of vertical cells, if not better.

The Council has power by the 1908 Act to calculate cube horizontally between floors of approved construction. No effect, however,



appears to be given to this provision, because if this method were adopted a large number of buildings would become exempt from the old and the new limits of height.

The Council of the Royal Institute of British Architects has now published the complete reports of the Building Acts Committee and the Standing Committees and its own conclusion, and therefore it will be unnecessary to repeat any parts, as reference can be made thereto.*

The Committee has not proposed any general increase in the heights of buildings, and it is unlikely that there would be any large number of higher buildings. It was only suggested that they should be permitted in circumstances which are stated and in those positions where no harm can arise. There are congested areas where higher buildings would afford far better accommodation than is at present available or likely to be provided without concessions as to height. A height of 120 ft. and stories in the roof are strongly advocated in the City, as will be seen from the resolutions passed by the City Lands Committee and the London Medical Officers of Health, and the opinions so expressed should have due weight.

The proposals for higher buildings have been met with some amount of derision—"skyscrapers" are not required in London, it is said, and if Trafalgar-square were surrounded with them the Nelson Monument would become a mere lamp-post, and so on. In order, however, that a better comparison may be formed a sketch to scale is given showing American "skyscrapers," then taller English buildings, down to London buildings as now permitted and proposed. The present height of 60 ft. has an entirely ridiculous appearance, and even with the additional height to 80 ft., to the ceiling instead of floor, will only add some 5 ft. to that shown on the sketch. The liberty given in Liverpool, Manchester, and other towns does not place London in a creditable position.

It has been stated that the circumstances which gave rise to tall buildings in America arose from the limited areas of available land. This may be true as regards New York, but it does not apply to the large number of other towns and cities where they are common, while the needs of the City of London in some areas are as imperative as those of New York. In America there seems to be almost complete freedom. The large stores there have unobstructed floor areas up to 90,000 superficial ft., with twelve or even more stories, while the stairs are unenclosed; neither are the lifts provided with smoke lobbies, and yet no serious fires have been reported.

It is generally agreed that any general increase of taller buildings is not desirable, but there can be no objection to a moderate number, and neither amenities nor circulation will be affected. The powers of the London County Council are stated to be exercised in a reasonable way, but had this been the general view there would not have been any ground for the agitation which has now been going on for a very considerable time.

As regards housing accommodation, suitable flats are very much needed in London, and the provision of a few blocks some ten or twelve stories in height cannot be reasonably objected to; if this accommodation is not of a character suitable for family life, it would certainly be convenient for large numbers of people. The great demand for such accommodation is sufficient to prove this.

The last clause of the report of the Royal Institute Council's views is satisfactory in part, as it confirms those of the Committee, but there is no reason why the restriction as to height and cube should be limited by the necessity for securing unity of design.

It has been stated that two architect members of the Royal Academy have endeavoured to obtain the sanction of the London County Council to buildings considerably exceeding the permissible heights, in one case to some 260 ft., but have been restricted to about 100 ft. These endeavours, however, appear to show that the members of the profession are not entirely in agreement with the Council.

It is therefore to be hoped that in the general interests of the community more liberal and modern views may be adopted by the London County Council in the future, and that the Fire Brigade will give due regard to the facilities afforded for extinguishing fires within buildings, and not judge the matter entirely by its own capacities.

* An abstract of the report appeared in our issue for February 17.

We have received the following letter on the subject of higher buildings from Mr. Paul Phipps :—

Sir,—There has been a good deal of discussion lately in the Press and elsewhere as to the desirability of higher buildings for London. The Council of the Royal Institute of British Architects having appointed, to go into the whole question, a Special Committee whom it presumably considered qualified to do so, has turned down the majority report of this Committee and has endorsed a minority report signed by only one member. The question is not, however, finally shelved, as the Council of the Institute has invited the members to discuss the question in full at the meeting on March 6 [see next column].

The great days of building in all times and countries have been those in which the architect has whole-heartedly and intelligently interpreted and guided the wishes and needs of his time, honestly and frankly accepting the problems as they arise and solving them. Are we doing so in London now? Everybody knows that the business community of the City, at any rate, is not satisfied—and is right not to be satisfied—with things as they are under the existing building regulations. How can it be otherwise when no owner knows, without awaiting the decision of a Committee of the London County Council upon his special case, exactly what he may do or to what height he may build on his particular site? This, of course, means great uncertainty, considerable delay, and unnecessary expense, all of which hinder commercial enterprise.

In the United States, where architecture is a living and inspiring art, the problem has been frankly faced, and it is generally accepted that in those sections of any city which are solely given up to industry and commerce it is reasonable to make special regulations as to height, construction, &c., which will enable the requirements of the community to be met. The problem, in fact, is stated by the business man, and the architect solves it—which is how things always have been and always must be when architecture is alive and playing its part. How splendid can be the result of such courage, vision, and co-operation is familiar to anyone who knows America, or even visited the exhibition of photographs of American architecture recently shown in the R.I.B.A Galleries. Are things as healthy with us? We know they are not. The demand for higher buildings in certain places is there; it is very real and is bound to become more urgent. If we architects have the vision and courage of our American brothers we can meet this demand and keep it on the right lines here as successfully as they have done. No one wants skyscrapers in the City of London, and it may be that some modifications are desirable in the proposals put forward in the majority report; but we may at least be certain that the only course that is absolutely fatal is wilfully to shut our eyes to what we know—sooner or later—must be, and to offer no help or guidance, as we shall be doing if the Royal Institute of British Architects is content to leave things as they are by the endorsement of the minority report.

Paul Phipps.

The Royal British Colonial Society of Artists.

The Council of the Royal British Colonial Society of Artists has elected Mr. W. E. Riley, F.R.I.B.A., a member, as representing the Royal Institute of British Architects on that Society.

Election of Students.

The following candidates, having passed satisfactorily through the architectural courses at the "recognised" schools indicated against their names, have been registered as "Students R.I.B.A." The asterisk denotes students exempted from the Intermediate Examination under the Special War Concession to Probationers :—

H. H. Khan (Sir J. J. School of Art, Bombay).
O. W. M. Law (London University).
A. G. MacDonald (London University).
*C. H. Moxon (Wakefield).
Doris Musker (Liverpool University).
*F. Newton (Derby).
P. M. Patker (London University).
*W. T. Powell (Kilburn)
H. F. Prynne (Architectural Association).
A. S. Reid (Robert Gordon's Technical College, Aberdeen).
Winifred Ryle (Architectural Association).
*A. J. Saise (Bristol).
G. B. Scotland (Glasgow School of Architecture).
*W. G. Seaton (Pontypridd).
L. F. Shroff (London University).
S. E. E. Wesker (Liverpool University).
E. Williams (Liverpool University).
T. J. R. Winn (London University).
T. Yoxall (Liverpool University).
E. R. Arthur (Liverpool University).
J. S. Beaumont (Victoria University, Manchester).
B. Butler (Liverpool University).
A. O. Chatterley (Liverpool University).
V. G. Cogswell (London University).
E. G. Cooke (Architectural Association).
E. E. Edmunds (London University).
S. A. Elijah (Bombay).
H. M. Gimson (London University).
J. D. M. Harvey (London University).
*V. A. J. Helbing, (London).
H. Hirst (Liverpool University).
Eleanor K. D. Hughes (Architectural Association).
C. L. Hutton (Liverpool University).
T. T. Jenkins (Liverpool University).

Annual Dinner.

The annual dinner of the Royal Institute of British Architects will take place at Prince's Restaurant on Wednesday, May 24.

Proposed Higher Buildings for London.

At a meeting on Monday next, at 8 p.m., when the subject of higher buildings for London will be discussed, the following motions will be before the meeting :—

"That this meeting approves the action taken by the Council in connection with the report of the London Building Acts Committee"—to be moved by Mr. Maurice E. Webb and seconded by Mr. Raymond Unwin.

"That this meeting approves the general principle of allowing buildings to be erected, in certain positions, to a greater height than is the present practice, subject to proper safeguards as to construction, fire escape and fire attack"—to be moved by Mr. Delissa Joseph and seconded by Mr. H. Austen Hall.

Probationers' Qualifications.

Applicants desirous of qualifying for registration as Probationers R.I.B.A. must, in future, produce drawings showing an elementary knowledge of freehand drawing, instead of examples of geometrical, perspective and freehand drawing.

THE SOCIETY OF MURAL DECORATORS.

THIS exhibition at the Ashmolean Museum, Oxford, is, we believe, the first the Society has held since the war, and coming at a time when so many proposals are on foot for the encouragement of mural painting it has a special significance. The gallery is well lighted, and the work is all shown to advantage. The central positions are occupied by the following artists: John D. Batten, Charles Sims, R.A., Charles Ricketts, and Mrs. Sargant Florence. The death of Lady Feodora Gleichen gives a pathetic interest to the catalogue. No. 1, "Plaster Cast of Memorial, Meiford Church, Mon.," is the work of this distinguished lady. For many years she had regularly exhibited at the Royal Academy as well as at the International Society and on the Continent. To Legros's teaching she owed much of the form and character of her work, and her death is a loss to this Society which its members will all regret.

Nos. 3 and 3A, by Mrs. Bernard Jenkin, are graceful and dignified. No. 4, "Spring: Design for Tapestry," by Mrs. Sargant Florence, does less than justice to her genius, which is better represented by the photographs of her noble frescoes at Oldham (these and other photos, unframed, are on view in a portfolio). Nos. 8 and 27, by Reginald Hallward are the only examples of stained glass appropriately included in mural decoration. No. 9, "Deep Midnight," by F. Caley Robinson, A.R.A., shows this distinguished artist at his best. No. 16, the largest picture shown by J. D. Batten, which is in the possession of University College, Reading, is so scholarly and fine both in conception and execution that the College is to be congratulated on its possession. The nude figure of Pandora—as yet an image not endowed with life—is beautiful. No. 21, by Mrs. Sargant Florence, is exemplary in a masterly way of the handling of true fresco. Nos. 25, 26, 27, 36, 37, 38, 57, by Reginald Hallward, are the only exhibits which show in most cases the actual adaptation of mural design to the building itself. These examples from work scattered about the country, amongst which may be mentioned the wall paintings and decorations in Oldham Parish Church, wall paintings and altar piece in Lustleigh Church, Devon, roof and wall decorations in the memorial chapel, Great Warley, a series of wall paintings and decorations in Little Lever Church, Lancs., are but a few examples out of many by an artist who has probably done more actual mural painting than any other. No. 30, "Extreme Unction," by C. Sims, R.A., is interesting. In many of this artist's pictures it is difficult to guess the medium, but this is direct tempera painting resulting in a luminous colour effect that holds the eye the whole length of the gallery. No. 28, by J. Southall, is a brilliant example of his work, but modern costume does not give sufficient freedom for his design. Nos. 44-47 form an important group in which the folds of drapery of the figures and the details of Gothic architecture are used in one harmony of design. The colour is refreshing, bright, and clear, but there is in some cases a farther departure from the forms of Nature than is required by the decorative purpose. No. 51, by Francis D. Bedford, an artist distinguished by the refined sensibility of his work, is a very successful attempt to catch the romantic effect of lanterns carried in late twilight by a procession of children across the bridge of dykes—probably an Armistice celebration on the East Coast.

Interesting work by F. E. Jackson, Charles Shannon, Walter West, and others not less important, make up altogether an exhibition over which the glamour of poetry and aspiration rests. We have here the evidence that we do not lack artists of ideas and of mastery in their practice to decorate our public halls, and the surprising thing is that at such a time we should be groping about for young students to decorate them when there is this fine accomplishment existing which, so far as we know, is offered very little opportunity. Unfortunately, over the past years, owing to the intensely unsound practice of artists, there has been invented a sort of substitute for the art of mural decoration, born out of the studio alternative—a decoration carried out on canvas in the studio to be afterwards stuck on the walls of the building to be adorned. So evil has been the influence of this practice that it has bred a sort of convention which is neither easel picture nor mural painting, but the outcome of these theories. One may observe instances of an artist of fine sensibility to treatment in his practice as a painter, when asked to carry out mural decorations, owing to these theories, falling into a convention of large empty spaces of cloud and tree forms and the general flatness supposed to be necessary to this theory of wall painting, though ancient practice contradicts it altogether. Had the artist, equipped as he was with a fine sense of treatment in painting, relied on that and on the wall to be decorated, to tell him how to apply his knowledge, he would not have deserted the natural wealth and quality of his handling as a painter for a dismal theory of how mural painting should be executed, but, leaving the wall and the conditions to instruct him, as they would faithfully have done, there would have been all the right conditions to inspire him in his work.

We must have sound practice, the result of conviction and character, before we can have successful wall painting. Nor is size, in such a case, of the importance shown for it. The proportions of figures and ornament must be right to the walls, and the walls will tell us what that is. But to start with a theory that immense figures such as those painted in the lunettes shown at the last Arts and Crafts Exhibition at the R.A. some years ago are necessary to wall painting is wholly to misconceive its nature—size, in this sense, has nothing to do with it.

WALL DECORATION.

IN the course of an address delivered recently at the Ashmolean Museum, in connection with this exhibition, MR. J. D. BATTEN said fresco was, until the recent invention of waterglass painting, the only manner of painting that did not rely for the adhesion of its pigments on some organic substance. The distinction between painting in fresco and painting in secco was the most fundamental difference that could be marked between methods of painting. But if there was no sticky stuff added to the colours to make them hold on, why did they hold on in fresco? That they held on with remarkable tenacity was very evident, and he supposed more evident to them in Oxford than to others, for within the Museum building there were specimens of pure fresco painting done at Knossos on a purer lime plaster than had ever been employed since, and that painting had held for three or four thousand years. True it had been buried, but even burial was not always a sure preservative, and it was not buried in the waterless deserts of Egypt but near a seaport town in Crete. That painting had been examined by Mr. Noel Heaton, and the record of his examination left no doubt that the painting was fresco. No trace of any organic substance could be found in the pigment, and the plaster was now pure carbonate of calcium throughout. He did not think the value of that discovery had been fully appreciated. It not only gave to fresco an antiquity which no student of art had hitherto dreamed of, but the analysis of the plaster afforded a clue to the secret of its durability.

In fresco the pigment was held by a film of carbonate of calcium, which formed almost instantaneously by the action of the carbon dioxide in the air upon the water-saturated surface of the lime. The plaster must be freshly laid each day, and the painting must follow as quickly as possible after the laying of the plaster. That carbonisation, which began so swiftly, continued little by little and slower and slower until the lime became carbonate of calcium throughout. But if the plaster was thick that might take centuries. Cennino Cennino, writing in 1400, distinctly calls fresco painting without tempera; every other kind of painting was called painting in tempera.

Gradually the different kinds of tempera were given different names. Pigments mixed with oil were called oil paint, and pigments mixed with gum arabic were called water colour. The word tempera became more and more identified with pigments mixed with yolk of egg, and every other kind of painting became either "a deed without a name" or took shelter under some such doubtful appellation as "distemper" or *gouache*. Painting with yolk of egg tempera was the painting in secco fully described by Cennino, though there were certain pigments which he recommended to be tempered with parchment size. Yolk of egg was an emulsion. One might say that half of it was water and that of the other half two-thirds were oil of egg and one-third albumen. The water evaporated and the substance that remained to bind the pigment consisted of two parts oil to one part albumen. The albumen slowly coagulated and became insoluble; the oil hardened, probably by the absorption of oxygen, like any other drying oil. The significant fact was that yolk of egg painting was more oil-painting than anything else, and it was that preponderance of oil that gave the paint its toughness and eliminated the danger of cracking, which was certainly not absent from white of egg.

What he was keen about was that, whatever medium were employed, no trouble should be shirked that would make them familiar with the stuff being used from the first priming of the panels or canvases to the last varnishing of the pictures. The fact had to be faced that painters knew less about the stuff they were using than was known four or five hundred years ago. The paintings of the Van Eycks were done by men of greater knowledge than ourselves. It was well that the fact should be recognised, but it was not well that it should be recognised complacently. It was one that called for sweat and tears. The whole great world of science was advancing into unknown lands with victory, and painters were falling back in knowledge for centuries. How had it happened? Chemistry was essentially the knowledge of the nature of materials. The chemistry of 1400-1450 was a thing insignificant, in some aspects ridiculous, compared with the vast knowledge of to-day. With all that wealth within their reach, how was it possible for painters to confess themselves so poor? He thought it had come about in two ways, not unrelated—(i) The chemistry of 1400 might have been a little thing, but the painters and the craftsmen knew it all. (ii) It had been forgotten how much there was that we need to learn that could not be taught by words—the look and feel of things. If the architect had known the feel of a piece of English oak under the saw, under the plane, under the carver's gouge and chisel, he would never have designed *that* chancel screen. It was not that the task could not be carried out, it was that the task would never have been set. And if the mural painter had known the feel of the plaster under the trowel, the feel of the pigment under the muller, he would never have wished to do that painting *so*. The materials of the painters' craft, wall plaster, panel, canvas, gesso, pigment, tempera, and varnish needed to be learned by handling just as much as iron or copper, oak or pine. But every opportunity of handling that could be shirked had been shirked. Everything that could be done had been done to save pains. We shall bring nothing to birth that way.

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ILLUSTRATIONS.

Sheffield Cathedral.

The design for Sheffield Cathedral has been prepared with the object of providing adequate accommodation without destroying any ancient portions of the existing Parish Church, which, though it has been very much restored, is of some interest and antiquity.

There is space in the churchyard for considerable extension on the north side of the present building. It is proposed to duplicate the main features of the old church here, leaving space for the large nave between the two towers. The principal feature of the new work will be the east end, which it is proposed to treat with large windows in order to obtain a lantern-like effect. The west front will reach nearly to the boundary of the site, and at first will be rather confined with the existing buildings, but the property facing the churchyard belongs to the church, and it will be possible at some future date to widen the street in front of the west end.

The new work is to be built of stone, and the style is consistent with that of the present building. It is hoped that a commencement of the work will be made as soon as the present trade depression is over.

The architect is Sir Charles A. Nicholson, Bart., F.R.I.B.A., of 2, New-square, Lincoln's Inn, W.C.

MEETINGS.

FRIDAY, *March* 3.

College of Estate Management.—Mr. M. C. Duchesne on "British Timber." At 35, Lincoln's Inn-fields, W.C. 5.30 p.m.

Town-Planning Institute.—Mr. Barry Parker on "Zoning to Secure Amenities." At 92, Victoria-street, S.W. 6 p.m.

MONDAY, *March* 6.

Royal Institute of British Architects.—Election of Royal Gold Medallist, and discussion on Higher Buildings. At 9, Conduit-street. 8 p.m.

Surveyors' Institution.—Mr. B. Price Davis on "The Analysis of Building Costs." At 8 p.m.

TUESDAY, *March* 7.

Liverpool Architectural Society.—Mr. H. A. Dod on "Interior Decoration of a Liner." 6 p.m.

WEDNESDAY, *March* 8.

L.C.C. Central School of Arts and Crafts.—Sir Banister Fletcher on "English Mediæval Architecture: The English Home." At 6 p.m.

Institute of Builders.—Annual Dinner. At Hotel Victoria, S.W. 7 p.m.

Manchester Society of Architects.—Dr. Oscar Faber on "The Architect and the Structural Engineer." At 6.15 p.m.

University College Lectures.—Mr. Martin S. Briggs on "Historical Building Construction: Roofing." At 6.15 p.m.

THURSDAY, *March* 9.

Society of Architects.—Mr. J. A. Knowles on "Ancient Painted Glass." 8 p.m.

THE OFFICE OF WORKS.

In referring to a letter which it published in the same issue, the *Morning Post* of Friday last makes the following pertinent observations on the Office of Works in its editorial columns:—

"The public are rightly satisfied that since the appointment of the Earl of Crawford to be First Commissioner the Office of Works is for the first time conducted by a gentleman of taste, learning, and impartiality. It was under the rule of his predecessor that the Office of Works became notorious. On more than one occasion we felt obliged to inform the public that the Office of Works, which had largely increased its staff during the war, was maintaining its establishment in time of peace, and was, further, doing its utmost to become, in fact, the State Building Department, to the great injury alike of the architectural profession and of the art of architecture. Under Sir Alfred Mond, the Office of Works became engaged in the State housing schemes, and practised building for local authorities. It would be interesting to know in how many cases, if any, the private architect was displaced by the intervention of the Office of Works. That the expense of these operations was incredible was shown in the estimates, of which Sir Alfred Mond's explanations were far from lucid. Moreover, in several instances, the Office of Works secured the design and erection of important Government buildings, which, before the war, would have been submitted for competition to the architectural profession. In the case of buildings erected by a Government department there is no assurance—but a strong probability the other way about—that the public are given the best design obtainable. But there is a certainty that the cost will be excessive. A schedule of the amount of public money spent under Sir Alfred Mond's tenure of office would, we think, dismay even the disillusioned taxpayer. There is another branch of the Office of Works into whose administration our correspondent desires investigation. The Office of Works is responsible for the maintenance and repair of ancient and other buildings, which are national property. We have received many protests against the manner in which the Office of Works fulfils these duties. It seems to us that no Government department should be allowed to meddle with ancient buildings except under the strictest supervision by the highest professional authority. Indeed, in the interests of the nation, it is extremely advisable that the Office of Works should be restricted to its original duties of carrying into execution small repairs, and that any more important work should be entrusted to practising architects."

At the Society of Antiquaries on Friday last, in the course of a discussion following a paper on Jedburgh Abbey, by Sir Frank Baines (Director of Public Works), Mr. C. R. Peers (Chief Inspector of Ancient Monuments) said that being a Government department the Office of Works had to proceed more carefully than perhaps others might do. The suggestion in the *Morning Post* implied that the Office of Works had no professional architect, but the Department had come to the conclusion that it must risk this criticism. They might be called vandals, but he hoped that in the next ten or twenty years their work would be justified.—Mr. J. Leighton said he totally disagreed with that point of view. The work of repair took away all the romance of the building as it appealed to a painter, poet, or average person. Let our buildings remain as time left them. The genius of Sir Frank Baines was misapplied. He should be expressing the spirit of his day in new buildings.—Sir Aston Webb, P.R.A. (who occupied the chair), said he would rather have Jedburgh repaired than no Jedburgh at all.—Sir Frank Baines, in reply, said he felt that if we once contemplated the loss of the great works of the past, we might as well contemplate the burning of our famous libraries or magnificent paintings. Romance would return. None had been taken away by the recent work done to Westminster Hall, and the romance of that Hall would be felt 300 years hence, instead of only ten years if the repairs had not been done.

The final report of the Geddes Committee deals with the Office of Works, in reference to which it contains the following:—

The gross reduction shown in the Revised Estimates for 1922-23, as compared with 1921-22, is £179,400, of which £72,000 is due to fall of bonus and £76,000 to decrease of the staff employed on the house-building work performed by the department as agents for certain local authorities under the Government housing scheme. The curtailment of this work has, however, reduced the estimated receipts from the charges made for overhead expenses from £150,000 to £15,000, so that the net reduction is £44,400. While the work of the department will fall with the diminution of Government activities, the staff cannot be reduced *pari passu* with the reduction in Government staffs generally, owing to the work involved in concentrating the diminishing staffs in as few buildings as possible and disposing of the accommodation vacated. In view of the foregoing consideration, we are not in a position to recommend any reduction of the revised estimate of £538,500, which compares with the Provisional Estimate of £559,500, but we consider that the staff of the department should be kept under constant review and that substantial further reductions should be possible by the beginning of the financial year 1923-24.

The Provisional Estimates were framed upon a rationing basis equivalent, on the whole, to two-thirds of the current year's provision. Since that date examination of the detailed requirements has enabled further reductions to be effected, particularly as regards new works. . . . The only considerable items for new permanent buildings are:—New Spirit Building at the Natural History Museum (£39,500); New Science Museum (£36,500); New Post Office Buildings (£146,708); minor Post Office Works (£54,725); Inland Wireless Stations (£34,000). A provision of £257,000 is proposed for the provision of temporary Employment Exchange accommodation, £82,000 being required to complete work in progress. In view of the uncertainty as to the future of the Employment Exchanges we think that hirings should be resorted to wherever possible, and that the proposed provision might be reduced by a least £50,000.

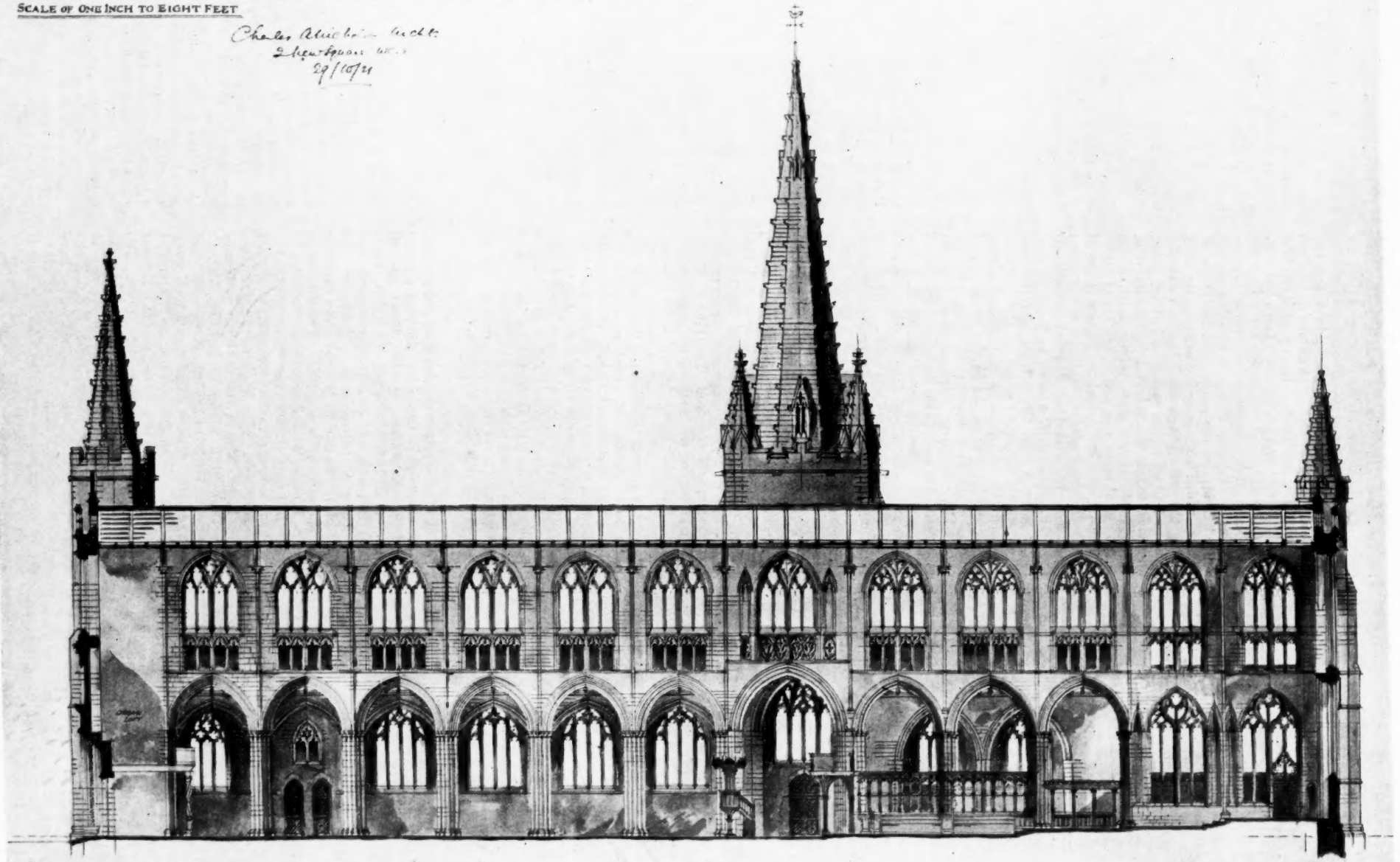
Under the head of "Maintenance," steps have already been taken to restrict expenditure. Reduced standards of engineering and building maintenance have been adopted. We think the department is actively pursuing economies and we do not suggest any further reduction of the revised standards. In view, however, of the continued tendency of prices to fall and of the need for economy, we think a further over-all reduction of, say, 5 per cent. might be made on the total maintenance provision in these votes. . . . With regard to certain housing schemes erected during the war by the Ministry of Munitions and a housing scheme at Woolwich erected by the Office of Works under the Housing Act, 1914, together with certain small schemes now being taken over from the Service departments, the total capital expenditure incurred amounts to £1,526,000, which will be increased by certain expenditure necessary to acquire sites now held under the Defence of the Realm Act only. It has been found necessary to add £30,250 to the estimate for this purpose. Allowing for outgoings and losses due to bad debts and voids, the net rental would not appear likely to exceed £90,000 a year, which would represent barely 2 per cent. on capital expenditure. We recommend that, as in the case of the houses erected by local authorities under the Government housing scheme, vigorous efforts should be made to effect sales.

As a result of its deliberations, the Committee expresses the opinion that in view of falling prices and the need for economy, a reduction might be effected in the provision for maintenance of buildings made in these votes, and that the net total of the estimates for public works and buildings under the Office of Works for 1922-3 should be reduced to £6,000,000, as compared with the provisional estimates of £6,643,750 and the revised estimates of £6,201,120.

SHEFFIELD CATHEDRAL

SCALE OF ONE INCH TO EIGHT FEET

Charles Nicholson Esq Bt
2 Newton Square W.C.1
29/10/21



LONG SECTION THROUGH NAVE LOOKING NORTH

SIR CHARLES A. NICHOLSON, Bart., F.R.I.B.A., Architect. (*See p.* 337.)

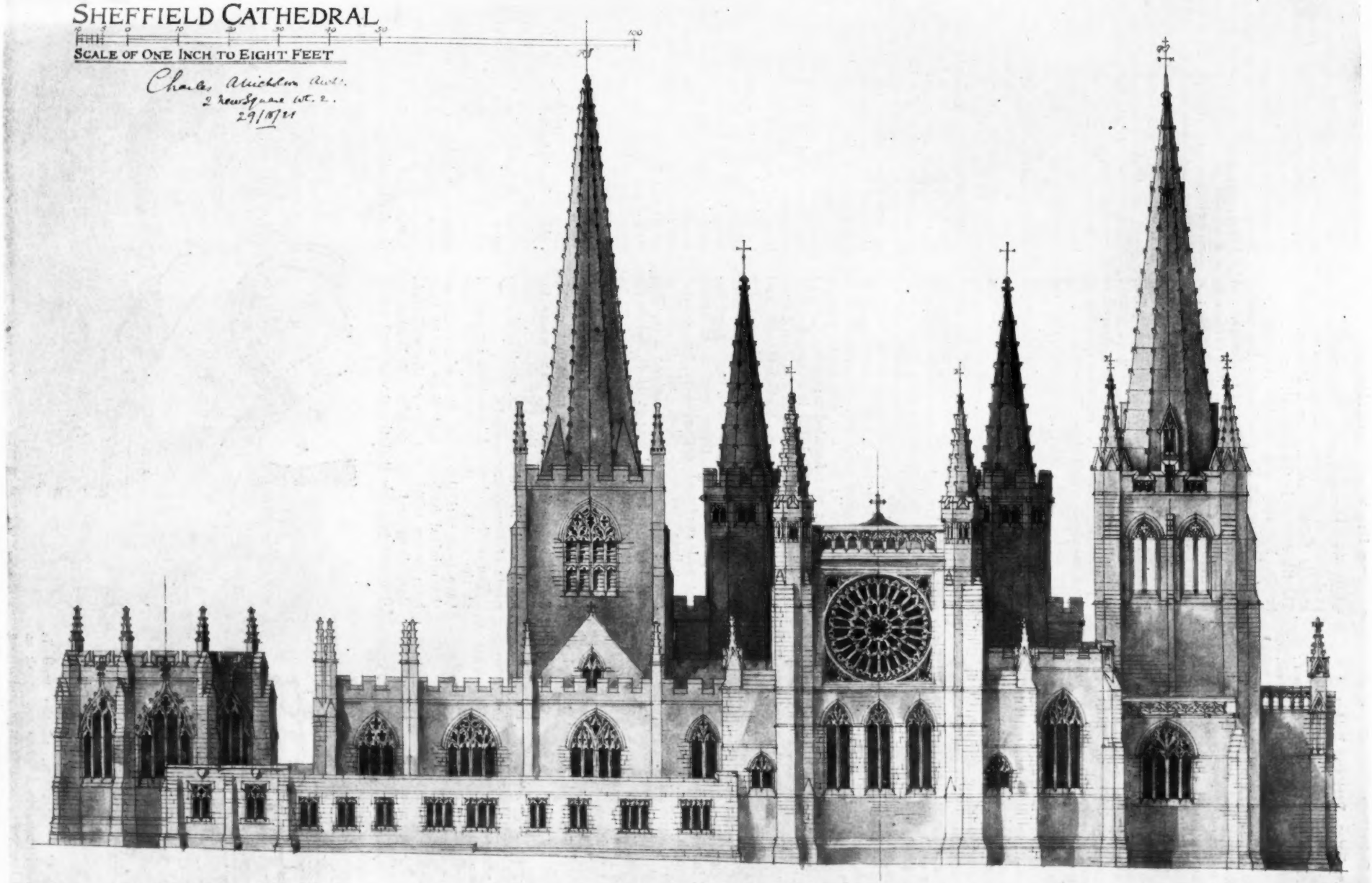
THE BUILDER

[MARCH 3, 1922.

SHEFFIELD CATHEDRAL

SCALE OF ONE INCH TO EIGHT FEET

Charles Nicholson Bart.
2 Rowsquare W. 2.
29/10/21



EAST ELEVATION

SIR CHARLES A. NICHOLSON, Bart., F.R.I.B.A., Architect. (*See p.* 337.)

LONDINIUM: ARCHITECTURE AND THE CRAFTS.—III.

BY W. R. LETHABY.

Walls, Gates, Port and Bridge.

Gem of all Joy and Jasper of Jocundity,
Strong be thy walls that about thee stand;
London, thou art the flower of cities all.
—W. DUNBAR.

THE course of the wall of the Roman city has been accurately laid down and the positions of the main gates have been discovered. For full description and a plan see the Victoria County History and *Archæologia*, lxii (1912). A good description of what was visible in 1855 is given in *The Builder* for that year.

In September, 1903, an important section of the Roman wall was found in excavating the site of Newgate prison; in some parts it was about a dozen feet high. I saw it in October and noted—"The wall is about 8½ feet wide. On the outside and inside one or two courses of facing stones were first raised and the core of rubble was then filled in to that height; first there was a thick couch of mortar, then a layer of rubble stones, then another liberal supply of mortar running down between the stones as grout; there were two or three such levellings-up in the heights between the tile bonding courses." The wall had a rough rubble foundation, then a course of plinth stones on the outside, with three tile courses corresponding to it on the inside of the wall, then followed five courses of the fairly square facing stones on both sides of the wall, then two rows of tile, five courses more stone and two rows of tile, then five more stone courses; above this level the wall had been destroyed. The stones and tiles were set in mortar, and the latter, except for the three at the bottom on the inside, which served as a plinth, were carried right through the thickness of the wall; the "tiles" were Roman bricks about 18 in. × 12 in. and 1½ in. thick, laid in what we call Flemish bond. The stone facing courses were a little higher at the bottom than upward, but all were comparatively small and square; there was a clear distinction between the wrought facings and the rubble filling which was practically concrete. The "facings" were hard skins adhering to the filling and required by the method of building (Fig. 1).

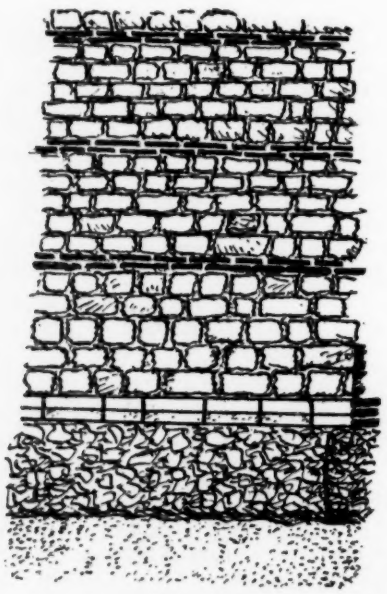


FIG. 1.

The mode of construction of the wall is likely to be misunderstood when we speak as we almost necessarily do of facings and filling and of bond tiles. The "facing" stones were small, roughly wrought, and set in much mortar; they formed outer skins to the concreted mass into which they tailed back. The whole was homogeneous. The method was analogous to the facing of concrete with triangular bricks notching back into the core. The tile courses in the City wall were doubtless bonds, but they also divided the wall into strata locking up the moisture of the mortar from too rapid absorption and evaporation. I have little doubt that the wall was carried up a stratum at a time over long lengths; it would thus have been available as a defence from an early stage, and scaffolding would not have been required. The building of this wall and casting the ditch about it required a great constructive effort. A strip of ground some 100 feet wide must have been cleared as a preliminary. Then the immense quantity of stone required would have been brought by ships and barges. It is often said that old material was not reused in the wall, but I can hardly think that two miles of chamfered plinth had to be provided out of new stone at the very beginning of the work. The lime-burning, brick-making, stone-cutting, as well as the actual building called for much labour. It would be interesting to have the quantities taken out and an estimate prepared.

The south wall along the river front is well described in V.C.H. Roach Smith, in an article in Vol. I of the *Archæological Journal*, recorded the fact that it had "alternate layers of red and yellow plain and curve-edged [*i.e.*, flanged] tiles"; the rest being of ragstone and flint. It was founded on piles. In *The Builder* (January 19, 1912) it is recorded that in digging for a foundation at No. 125, Lower Thames-street, between Fish-street-hill and Pudding-lane, there was found the base of the Roman wall resting upon long and thick timber baulks laid crosswise, with piles beneath; there were three courses of rough rag and sandstone capped with two courses of yellow bonding tiles, all in reddish mortar; what remained was about 3 ft. high and 10 ft. wide, and was at 24 ft. below the existing pavement.

Full evidence of the course of the City wall along the river front has been found (*Archæol.* 63). It may be noticed that in mediæval regulations foreign sailors might not go beyond Thames-street; that is, pass where the wall had been, into the City proper. This south wall, like the bastions, contained remnants of Roman monuments.

The south wall would have been interrupted at the outlet of the Walbrook, which must have been a tidal creek. This was doubtless the original harbour, and there would have been quays within the line of the wall (*cf.*, Daremberg and Saglio's plan of Bordeaux). It seems probable that the strong wall which Roach Smith reports as having been found on the east side of the Walbrook may have been a quay wall. The Thames has been much encroached on where it passes the City. In making the approach to new London Bridge three successive embankments were found, one being of squared trunks of trees. A similar timber wall has just been found in Miles-lane. In Lower Thames-street the Roman house found on its north side was built on piles, "probably on the river bank" (*Athen.* 1848), and the south wall was wholly built on timbering. In earlier Londinium Cannon-street must have been the southern thoroughfare.

Bastions.—In July, 1909, when the angle bastion in Cripplegate churchyard was excavated, I noted that close to it the City wall was badly fractured, and inclined outwards; there had evidently been a serious settlement here which was sufficiently accounted for by the nature of the ground, wet clay on the bank of a stream. The wall was taken lower than the ordinary level here and the bastion was founded at a lower level still. The bastion was not bonded to the City wall but merely built against it with a straight joint; it was of horseshoe shape on plan and projected about 27 ft., the masonry was rubble in thin courses, and the whole looked mediæval to me. In the careful report in *Archæologia* it was said that some evidence for Roman date was discovered in the foundation. The facts suggested to me not only that the bastion had been built against the wall, but that it was probably built at a point of failure in the original wall. It is agreed that the bastions were built later than the wall, and with a straight joint between them and it, and I would suggest that they were built to cover cracks and form buttresses as well as for their additional defensive value, and this may very well have been the general procedure It would have been impossible to build a wall measured by miles on inferior foundations without bad settlements; the Egyptians provided for them by building such walls in sections with inclined straight joints at intervals.

M. Blanchet, writing of the walls of the cities of Gaul, says: "Often the curtains are not bonded with the towers. This independence reminds one of a precept of Philo's which advises that the method should be followed so as to prevent the consequences of unequal settlement between the two. But there is a more simple explanation—the town under immediate danger ensures itself first with the curtain and adds the towers after. Most of the fortifications are those which the Romans

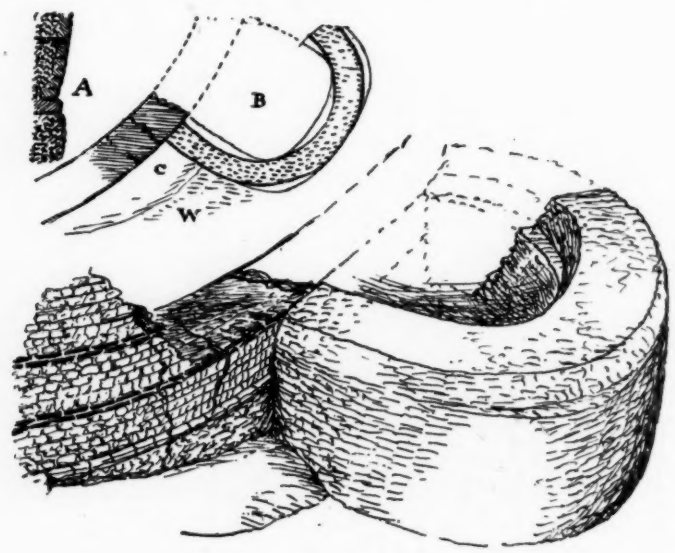


FIG. 2.

built on the approach of the Barbarian invasions. To this period belong the walls of Rome and those of the cities of Gaul." Choisy again has an interesting account of the towers of the walls of Constantinople, with a diagram of arches in the sides of the towers at the ground level, which were built so that the effective part of their foundations should be kept clear of the wall. Now, the foundations of the London bastions provide evidence of a similar way of thinking.

In Fig. 2 I give a sketch of this angle bastion made on July 5, 1909. Here is seen the City wall curving round from the north to the west and against it the bastion. The Roman wall was badly cracked and leaning outward (A); in the corner by the bastion the plinth and the foundation are seen, and below a sloping bank of wet clay (C), and further out water (W). The bastion was built of rubble, and was hollow to the base; the form was different below and above (see B). In the sketch the tile courses are seen going through the thickness of the wall.

The bastions which have been most carefully examined are those on the site of the General Post Office, described in *Archæologia*, 63 (1912). One is said to have been built in "the usual manner of random rubble"; it was separate from the City wall, and the foundation was deeper than that of the wall. A second was built in a very soft spot. "Why it should have been selected is not easy to see as at a little distance either way the builders could have found firm soil." Its site was an old stream bed, and the conditions might well be the cause of a settlement at the point. This, as suggested above, may have been the reason the bastion was erected just here. (For a bastion by Giltspur-street see S.A. Proceed. 2. S. XXII, 476.)

Nothing very definitely Roman was found in these bastions, but one at All Hallows was certainly Roman. This is described as (I condense) "built of stonework which like the rest, so far as they have been observed, is of random rubble built principally of irregular pieces and ragstone with portions of Roman tile (none complete) and other material; much of it appears to have done duty in some previous building. A base was formed of large square stones a uniform height of two feet; they had been employed in some former building; several had lewis holes. This base rested on a table of large flat stones 9 in. thick. Most of these seem to have been portions of a cornice. Roman origin was shown by red mortar in which the joints had been set." The foundation was about 3 ft. below that of the City wall, and projected into the original Roman ditch. What is called the "table" above was a square-fronted lower base; the back of this base was set in advance of the City wall; indeed, it was three feet in front of it on the eastern side and "the gravel in this intervening space was undisturbed." This gap is specially to be noted. The description of the masonry as random rubble must apply mainly to the core of the work, for the illustrations show an approximation to courses; indeed, on the east side, 13 courses may be counted in the photo up to a line which seems to be the top of a plinth; these courses averaged about 4½ in. high. The full significance of this account is only brought out on comparing it with Price's description of what was found in excavating the Camomile-street bastion. This bastion was founded on two deep courses of heavy stones taken from Roman buildings, many sculptured, and having lewis holes in them. These masonry courses were set 1½ ft. in advance of the City wall, one over the other, forming a straight joint, and leaving a gap which was filled with small stones "separated from the wall by an intervening space filled with rubble" (Price). This curious and carefully arranged construction in both bastions was clearly with the object of making the bastions take their bearings away from the wall so that they would tend to lean inwards against the wall; it is analogous to the arches of the Constantinople towers. This bastion had a batter or slope at the bottom of about 4 ft. high. Price describes the masonry as "rag rubble walling faced with random courses. The size of the blocks of which the facing was composed varied from 3 in. to 8½ in. thick [high] and from 5 in. to 14 in. long." This account is supported by the carefully executed illustrations which show coursed facings of small stones which seem almost identical with the facings of the City wall. Such masonry of small facing "blocks" with concreted rubble behind is certainly Roman. The masonry at the All Hallows bastion seems to have approximated to the same character; there it may be noticed the courses became narrower upwards; this was certainly not so regular as the masonry of the City wall, but it may be said to have resembled it (Fig. 3).

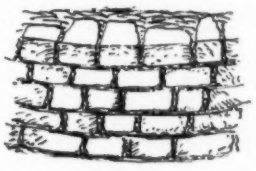


Fig. 3.

At the Guildhall Museum is "a group of architectural remains and fragments of sculptured stones from tombs, public buildings, etc., found in a bastion of London wall, Duke-street, Aldgate, 1881." This find is best described in *The Athenæum* for that year. Mr. Watkins, while excavating in Houndsditch and Duke-street, found the City wall and a mass of masonry extending 18 ft. outward from the wall; the stones were dressed and weighed from 1 cwt. to 1½ tons. "In the structure he observed a channel 15 in. deep by 18 in. wide, which showed signs of use as a watercourse. It had been filled with concrete composed of chalk and flints. The site was the foundation of one of the bastions composed of sculptured stones in character similar to those previously recorded, upwards of twenty in number." This was the second bastion S.E. of Bishopsgate. The channel filled with concrete suggests a gap dividing the bastion from the City wall as already described; but see also account in V.C.H.

In 1887 Mr. Loftus Brock reported to the British Archæological Association the removal of part of the City wall on the E. side of Wormwood-street. Nearly opposite Bevis Marks Synagogue the foundation of a circular-fronted bastion was found of worked freestones and not bonded into the main wall (*The Builder*, May 28, 1887). A paper by J. E. Price in 1884 (London and Middlesex Archæol. Soc.) referred to the discovery of a bastion containing several sculptured stones in St. Mary Axe (*The Builder*, November 22, 1884, and compare V.C.H.).

In 1852 an excavation was made against the outside of the City wall on Tower Hill, and a number of large wrought and carved stones were found (*The Builder*, Sep. 4, 1852) (Fig. 4). In an account given in the *Journal* of the British Archæological Association the workmen are said to have discovered a "complete quarry of stones cut in various forms with mortises at their angles and evidently belonging to some important building . . . 125 making 40 cart loads." Fairholt made an etching of the place while the work was in progress, which shows that the "quarry" was heaped against the external face of the wall like the bases of the other bastions, and that in fact it was a ruined bastion (Fig. 5 from Roach Smith's "Roman London" slightly modified). Another account is given in the Antiquarian Etching Club by A. H. Burkitt, with a plate: "These interesting remains were discovered during the excavations in June, 1852, which laid bare the wall to its base. The various portions of stone, which amounted to about forty cart loads, bear evidence of having belonged to an important building. The inscription and band of laurel leaves, which probably formed an ornament above it, indicate a monument of considerable magnitude to the memory of a commander of the Roman Navy. There were found at the same time fragments of frescoes with inscriptions."

The two stones specially mentioned are now in the British Museum. It appears from the accounts and illustrations that this bastion was built against the wall without being bonded to it in the lower part, that its foundation was formed of large carved and moulded stones, and was at a lower level than that of the wall (the part below the plinth in Fig. 5 on the left is rough foundation).

We thus have clear record that several of the bastions on the E. and N. sides of the City were constructed in a similar way. Those

Fig. 4.

farther west near the Post Office were probably rebuilt in mediæval times; these were hollow at the base, not solid like the others.

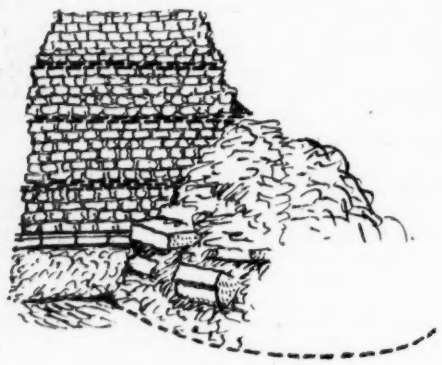


FIG. 5.

The towers of the city wall of Carcassone, described by Viollet le Duc (*Dict.*, Vol. I) were so similar in construction that it is plain our bastions were constructed according to general custom. In the illustration we see big stones at the base of the bastion only; large window-like openings closed with woodwork above; and an upper story rising higher than the wall top. Fig. 6 is a suggested restoration of one of the London bastions, showing the foundation gap A, and an upper story overlapping the City wall.

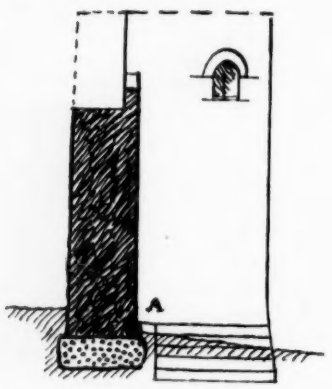


FIG. 6.

It is probable that most, or all, of the bastions from Tower-hill to Cripplegate were built in the same way as those just described, and there is evidence to suggest that the western bastions were also similar. In 1806 fragments of Roman monuments were found near Ludgate; "these may have come from a later Roman gate or from the adjoining bastion" (V.C.H.). Allen says "at the back of the London Coffee-house, Ludgate-hill, a circular tower and staircase was discovered; and about three feet below the pavement some remains of Roman art were found." An etching of the stones published by T. Fisher in 1807 describes them as "dug out of the foundations of the wall of the City a few yards north of Ludgate." Archer, speaking of an inscribed pedestal, says it was found "in extending the premises at the back of the London Coffee-house. It appeared in a bastion of the City wall, and was built in with the masonry near some remains of a circular staircase" (*Ill. Family Jour., c.* 1850). Now, Horwood's plan of 1799 shows the back of the Coffee-house adjoining the line of the old wall and extending a long way north—apparently much more than sufficient to overlap the bastion numbered 55 on Mr. Reader's plan. The post office excavations just made down Ludgate-hill show that the natural ground is here only about 10 ft. below the modern level.

The Camomile-street and All Hallows bastions were about 20 ft. wide and projected about 16 ft. In mediæval days the bastions rose above the parapet work on the main wall, and each formed a round-ended chamber having loopholes. This is well shown on the Survey of Holy Trinity, Aldgate, 1592, which I published about 1900 in "Middlesex Notes and Queries." (Several round-fronted bastions are planned as well as Aldgate itself.) The mediæval arrangement, I have no doubt, followed the Roman scheme. The openings in the original bastions would, we may suppose, have been wider than mediæval loops, with semicircular arches of brick over them. (See Viollet le Duc's "Dictionary," Vol. I, p. 333.) The walls and bastions which still exist at Le Mans more closely resemble those of Londinium than any others I have seen. A long portion fronting but some way back from the river Sarthe has three bastions 60 to 70 yards apart, round on the front about 20 ft. wide, and 15 or 16 in projection. The curtain is about 30 ft. high, and the bastions rise higher—say, to 40 ft.; they rise sloping for some way from the ground (Fig. 7).

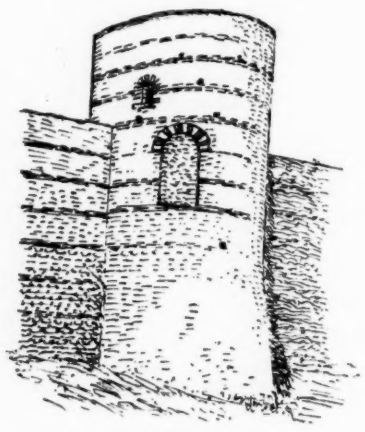


FIG. 7.

For a long time it was argued that the bastions of the wall of London were mediæval; then considerable differences of construction from the City wall has been alleged. It has been said that the masonry was unlike the other, and that there were no tile bands. We only know with any certainty the lower parts of the bastions now recognised as Roman, and there is no reason for asserting that there were no tile bands in the upper parts. The bastion illustrated by Roach Smith from a sketch by Gough had bands of brick, but in the illustration this bastion appears as square, and this is unlikely (see *Archæol.*, 63). It is possible, however, that the form is a misreading of a rough sketch. An illustration of a round-fronted bastion near Falcon-square given by Thornbury ("Old and New Lond.") shows two bands of tile. This seems to be bastion 40 of V.C.H., which was about 40 ft. high; "in the upper part was a row of tile-brick, probably due to later patching." There are also some other references to tiles in bastions, and on the whole I conclude that they probably had tile bands more or less like the wall. Both the bastion just mentioned and that of Gough's sketch had openings below the upper story, showing that in these bastions there were chambers below the level of the parapet. So there must have been at Le Mans (Fig. 7). Compare also V. le Duc's "Dictionary," Vol. I, p. 333.

It is not exactly known when the City was protected by walls. Stow says: "It seemeth not to have been walled in the year of our Lord 296, because in that year the Franks easily entered London." He accepted the legend that "Helen, the mother of Constantine, first enwalled this City." Camden held the same view, and has a note: "Coins of Helena often found under the walls."

It is now agreed that the walls were built around a late and extended city, for rubbish pits and burials have been found within the walls. A belt of the former occupied the site of St. Paul's and the Post Office. It was Roach Smith's impression that the walls were probably built "after the recovery of the province by Constantine, or even later, when Theodosius restored the towns" (*Archl. Jour.*, 1844).

Mr. Lambert, from planning the find spots of Roman coins, comes to the conclusion that the wall was not in its later position until the fourth century. The type of walling is especially characteristic of the fourth century. Haverfield has pointed out some earlier cases of the use of bonding tiles, but these seem to be exceptional. (See also what is said of Colchester in J.R.S., 1919.) Daremberg and Saglis give 309 as the date of the earliest wall of our kind in Rome. (They illustrate an example from Timgad, in North Africa, which closely resembles the wall of London.) I suggest that a point of evidence may be found in the Constantinian coin, which has a city gate or fortification, for device, and the inscription PROVIDENTIAE CAESS, with the mint mark of London (Fig. 8). This device

FIG. 8.

was not invented for London, but I cannot think that at such a time it could have been adopted if Londinium still remained an open city—it would have invited too obvious irony after what had happened in 296. This coin was issued between 320 and 324, and I suggest that it may be accepted as a record of the walling of the City, or, perhaps more probably, the beginning of the works. The coins of Helen mentioned by Camden were issued about this time. In the later half of the fourth century London acquired the title of Augusta, and this change of style probably followed on the change of status of its having then been completely walled.* Sir Arthur Evans has recently called attention to a silver coin of Valentinian the Elder as having in an abbreviated form the monetary stamp of *Londinensis Augusta.* "A group of coins shows that the mint at London, which had been closed since the time of Constantine, was restored by Valentinian in A.D. 368" (Proceedings S.A., 1915, p. 105). I suggest that this is a probable date for the completion of the river wall. Several of the cities of Gaul were protected by walls at a still later time.

Many of the carved fragments found in the bastions can be little earlier than the year 300 A.D. The important monuments of which remnants have been found must have been destroyed when the long, wide strip required for the original wall and its ditch was cleared, for the bastions themselves did not go beyond this ground. It seems possible that the big stones were reserved for founding bastions; this is more likely than that monuments were destroyed to provide foundation stones.

"To put an end to incessant pillage the Gallo-Roman towns sacrificed their faubourgs, and, retrenching their extent, surrounded themselves with strong walls, which were often supported on sculptured blocks taken from destroyed edifices. Le Mans, like the towns of Senlis, Tours, Autun, Bourges, Fréjus, etc., girded itself with ramparts flanked with round-fronted towers, of which important remains still exist, especially along the river Sarthe. The *enceinte* of Le Mans enclosed an area about 500 by 200 metres" (A. Ledru, 1900).

* I find that Mr. Reg. Smith has already made this same suggestion in V.C.H.

From time to time in going about France I have noticed the great similarity of the old Gallo-Roman walls in such cities as Tours, Senlis, and Le Mans, to those of Londinium. The walls of Tours had very small square stones set in much mortar on the face; the mortar was red with much gravel. The wall was divided into strata by tile courses, and the round-fronted bastions had window-like openings with semicircular arches.

"When the Visigoths threatened Touraine in the early years of the fifth century the Romans hastened to raise walls around the important towns. Apparently these walls were built at once after a general order, for one mode of construction is found in the walls of Bordeaux, Poitiers, Angers, Le Mans, and others. The foundations were formed of big blocks, on which are frequently old carvings, while above, the walling is in *petit appareil*, with bonding courses of brick. Some of the sculptured fragments at Tours seem to have belonged to a temple, and this leads us to suppose that the walls were constructed at a critical moment, and that that was at the beginning of the fifth century. The temples may have been destroyed earlier by the Christians. The city safely resisted attacks in 428 and in 446" (Clarey-Martineau: Tours).

Roach Smith, who was a very cautious observer, thought that there had been an early inner wall on the east side of Walbrook. He says that extraordinary substructures which were cut through in Bush-lane indicate a south-east (west?) boundary wall with a flanking and tower. Again, the late Mr. Black, after speaking of the south wall and saying that a part of it was found at the south-east corner of Suffolk-lane, added that another wall was found farther from the river above the Steep-lanes (Pamphlet 1863). There are certainly many records of thick walls found in this region. Thus when the Inner Circle Railway was excavated the works east of Dowgate by Bush-lane crossed what was taken to be part of the original City wall (*The Builder*, May 8, 1884). This may, I think, have been the quay wall of the Dowgate harbour mentioned above.

(To be continued next week.)

THE SOCIETY OF ARCHITECTS.

Mr. Edwin J. Sadgrove has been co-opted by the Council of the Society of Architects as President for the remainder of the unexpired term of office rendered vacant by the resignation of Sir Charles T. Ruthen. Mr. Sadgrove this year celebrates his "coming of age" as a member of the Society, having been elected in 1901, and since 1906 he has been a member of the Council, and has held office as Honorary Treasurer, 1910; Vice-President, 1914-15; and as President, 1916-20. His services to the Society were recognised by the Council in 1920, when they awarded him the Gold Medal. Mr. Sadgrove is one of the Society's representatives on the R.I.B.A. Unification Committee, the Building Trades' Parliament, the Architects' and Surveyors' Approved Society (of which he is also a Trustee), the Beaux-Arts Committee, the R.I.B.A. Conditions of Contract Conference, &c. Mr. Sadgrove is a Fellow of the Society, the R.I.B.A., and the Institute of Arbitrators, of which latter body he has recently been elected President.

The Sale of State Houses.

Sir A. Mond, in the House of Commons last week said no houses built by local authorities under assisted schemes had been let at a rent which would cover all charges on the capital cost. The sale of houses erected by local authorities had been consistently encouraged by his predecessor and himself. Schemes for purchase by tenants by easy instalments had been approved for that purpose. Fifty-two local authorities had applied for permission to sell houses, but he had no information at the present moment of the houses actually sold by them.

THE WEEK IN PARLIAMENT.

WESTMINSTER, *Wednesday.*

Housing and the Geddes Report.

SIR A. MOND informed Mr. G. Terrell that he was anticipating that he would be able to obtain the entire saving suggested on his Estimates for 1922-23, as recommended by the Geddes Committee, mainly on the proposals submitted by him.

Houses at Lincoln.

Sir J. Gilmour informed Mr. A. T. Davies that the whole cost of the erection of houses at Wragley-road, Lincoln, which were under the charge of the Office of Works, was paid for by moneys voted by Parliament. He was aware that the ceilings of 22 of the newly-erected houses had recently been condemned. The First Commissioner of Works was not aware that any compensation was payable to the tenants.

The Housing Subsidy.

Sir A. Mond informed Sir R. Newman that the period within which houses must be completed in order to qualify for Government financial assistance in Scotland had been extended to 1924. He had, on several occasions, given quite definite assurances that, where work had been undertaken by local authorities in England and Wales with the approval of his Department, and where, for reasons outside the control of the authority, the work could not be completed by next July, the time for completion would be extended as might be necessary.

Housing Commissioners.

In answer to Mr. David Davies, Sir A. Mond said the offices of the Housing Commissioners would be closed as from March 31. The duties of inspectors attached to the offices of the Regional Housing Commissioners had varied from time to time in accordance with the position of the State-aided housing scheme. They involved at present the inspection of work in progress and duties in connection with the preparation of final accounts of expenditure.

Unemployed in the Building Trade.

Dr. Macnamara, Minister of Labour, informed Mr. Thomson that the number of persons in the building trades of the United Kingdom registered at Employment Exchanges as unemployed on January 31 was 176,119, of whom 100,752 were labourers. The estimated amount of unemployment benefit drawn in respect of the week ended January 31 was about £105,000.

The Cost of Houses.

Sir A. Mond informed Mr. Gillis that the average all-in cost of houses in contracts made before June, 1921, was approximately £1,100.

Housing Policy.

BRICK CONTRACTS.—Sir Alfred Mond, Minister of Health, on a supplementary Vote for grants to local authorities, referred to the activities of the department for the supply of building material, which, he said, was originally started under the Ministry of Munitions for the purpose of providing bricks, as well as other materials, to the local authorities when the housing scheme was started. It then passed into the hands of the Ministry of Health, and he had been engaged in liquidating it since he had taken office. He had been occupied for a considerable length of time in cancelling a number of brick contracts which would not be required by the Government under the restricted housing scheme. Not only that, but local authorities had, on more than one occasion, pressed the view that they could get bricks cheaper if they were left to buy them by themselves, rather than if they bought them from Government departments. He was in favour of the local authorities doing what they thought best for themselves. Government stocks were being mainly used or were being re-sold to the makers for private sale, on the best terms that could be obtained. He was asking the House of Commons to grant £250,000 for compensation, which he thought was by no means unreasonable. His department had about 20,000,000 bricks on hand which would be handed over to the Disposal Liquidation Commission. They had cancelled 177 contracts for 142,000,000 bricks without compensation, and 197 contracts, representing 336,000,000 bricks, with compensation. They had also cancelled about 73 contracts for tiles—representing 31,000,000 tiles—69 without compensation—and about 90 miscellaneous contracts. The total brick commitments cancelled under the arrangement amount to £2,000,000.

During the discussion which followed, Mr. Myers (Labour), who moved the reduction of the vote, complained that instead of taking action to bring prices down, the Ministry of Health had actually increased prices.

Mr. Trevelyan Thomson said the crying need was for more employment and more houses, and yet the Vote would give less employment and less houses. Surely, it was an absurd position when a department which existed to supply houses asked for more money to defeat the building of those houses. It would have been better to spend the £250,000 on more houses. It was folly to spend such a huge sum on compensation; surely, some arrangement could have been made in regard to prices.

Mr. A. Hopkinson said it did not become Labour leaders to accuse builders' merchants and those who bought the material of profiteering. Labour itself had profiteered, and had formed rings of various sorts to "rig" the market, and there was nothing in dishonesty, in unpatriotic deed, and in greediness of profiteering that other people had perpetrated that went beyond what Labour in the building trade had perpetrated. They had, by deliberate slacking and by deliberately increasing the cost of production, put up the price of housing against the working classes of the country, and had placed infinitely greater burdens on the taxpayers. Ten millions of taxpayers' money was being simply thrown away year by year for the costly experiment in housing.

Dr. Addison, the former Minister of Health, in a lengthy speech, said the contracts were made by the Ministry of Munitions and not by the Ministry of Health. The matter was considered during the war, and a scheme was worked out, based on the assumption that after the war there would be a great scarcity of bricks and that the right thing to do would be to encourage local production. But that scheme was put on one side for the scheme of the Ministry of Munitions. He agreed that buying by Government departments must evitably force up the price, and that was why he recommended the other scheme. The present housing policy of the Ministry of Health was expensive and uneconomical. The Government's heaviest loss at present prices on a £500 house would be only £20 a year, whereas two men unemployed in the building trade absorbed in State relief, relief from the guardians and payments from their unions, about £120 a year. Therefore, for every two men thrown out of work, the Government could get a house for six years for nothing.

Sir A. Mond, replying to the debate, said nobody in his senses would go on making contracts for building houses at prices which the local authorities could not afford. He hoped the Government would maintain a firm stand against profiteering, and that prices would get back to an economic level; then there would be economic rents and in the long run it would be better for everybody. In regard to contracts for bricks, most of the bargains for settlement were made at a flat rate with large federations of manufacturers. The alternatives before the Ministry were to repudiate the contracts, obtaining an Act enabling them to do so, or to arrange a compromise. He had tried to do the latter. No contract had been made for 1921–22, and no further contract was going to be made. He did not want to pay more for bricks than was necessary.

The Vote was carried by 140 to 58

THE ELEMENTS AND THEORY OF ARCHITECTURE.—V.

(BASED UPON THE FRENCH WORK OF M. GAUDET.)

BY T. P. BENNETT, F.R.I.B.A. (*Head of the Department of Architecture, Surveying, and Building, Northern Polytechnic*).

WALLS.—We now come to the commencement of the study of individual features. The first, and perhaps the most important, is the study of the wall. In the wall more than in anything else the dividing line between art and construction is very fine, but the artistic value of the wall is undeniable. It lends itself to architectural expression, and has been made to produce some of the most effective structures in all periods. The wall is a study in the nude, and, like the essays of the painter and sculptor, requires considerable knowledge and skill for its successful treatment.

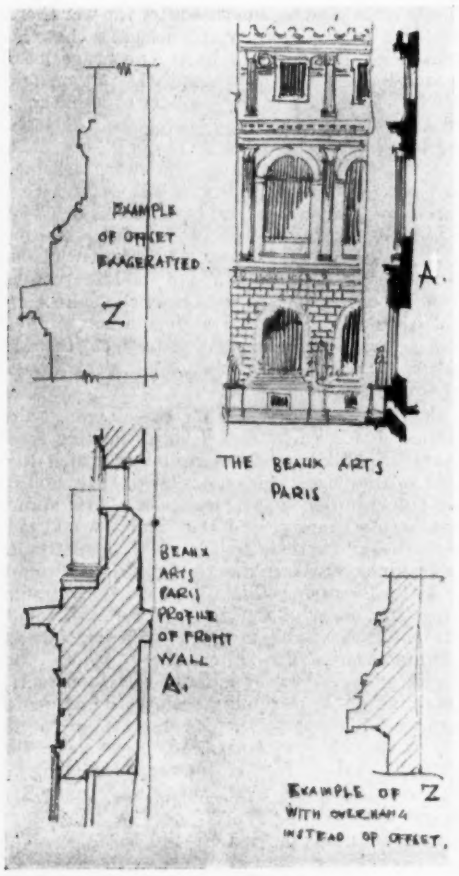
In Egypt we see the Propylæa at Carnae, the Temple at Philæ; in Rome the Tabularium; in Florence the Strozzi, Riccardi and Pitti; in Paris the Pantheon; in London the White Tower (at the Tower of London) and the Athenæum Club. All these buildings obtain their expression from the treatment of their wall surfaces.

The functions of walls vary considerably, but may be broadly classified under two heads, viz.: (1) isolated walls, (2) collective walls.

Under the first heading we have such walls as terrace walls, retaining walls, and others which are self-supporting and able to resist thrust or overturn.

Collective walls are themselves quite unable to resist the disturbing forces acting upon them, but obtain assistance from cross walls, floors, and other supports. In the first category, walls are rarely less than one-fifth of their height in thickness, in the second they are often one-fortieth or one-fiftieth.

The conditions which govern the design of isolated walls and collective walls are therefore quite distinct, and require separate and careful consideration. In all early or primitive architecture we find timidity of construction, and as knowledge increases the thickness of walls and area occupied by supports decreases, thereby gaining great economy in (*a*) material, (*b*) money, (*c*) space.


EXAMPLE OF OFFSET EXAGERATTED
Z
A.
THE BEAUX ARTS PARIS
BEAUX ARTS PARIS PROFILE OF FRONT WALL A.
EXAMPLE OF Z WITH OVERHANG INSTEAD OF OFFSET.

Striking contrast will be observed by comparing the plans of buildings from periods when constructional knowledge was in its infancy and those in which it was at its height. Compare thus the Egyptian Propylæa with the Propylæa at Athens and a modern factory building. The saving of cost, material, and labour in the most advanced periods is remarkable, and is only rendered possible by knowledge.

The wall is constructed of a number of blocks of relatively small size, and these blocks must be consolidated into a wall. When an unbonded wall is loaded it becomes liable to unequal settlement. This tendency to settlement is counteracted by bond, and bond therefore becomes an element in the artistic design of the wall. The wall is also liable to fail by bursting in the directions of its thickness, and the artistic eye demands "headers" because of their structural necessity.

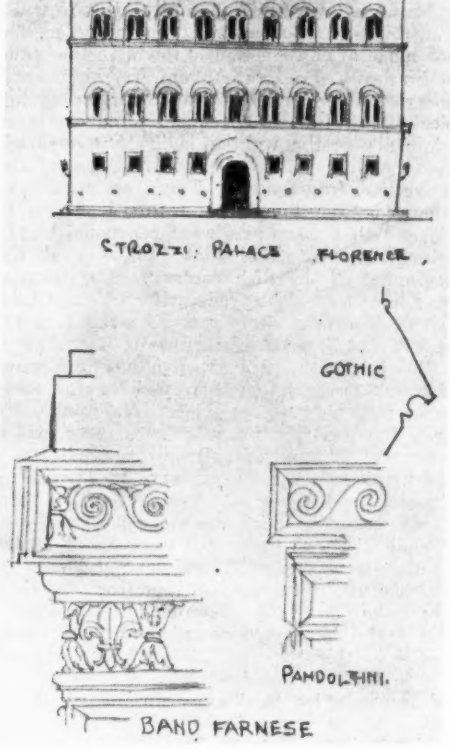
Nothing influences the design of the wall so much as the material. Ashlar walls have regular courses because the stone is highly worked. These regular courses are not expected from block in course or squared rubble walls—such walls would lose all character if attempts were made to give them definite regularity. In the dry wall of the Greek temple perfect bond is a necessity and becomes characteristic. The intersections of walls are structurally most important. The study of the practical necessities of bond soon shows that in masonry if not in brickwork only straightforward intersections can be dealt with satisfactorily, and from this structural fact we get yet another reason for the soundness of direct planning. In a wall constructed of two different materials (such as stone rubble with brick lacing courses, or squared rough stone of small size used with larger and more carefully worked stones) there may be an effect of horizontal bond, or there may be vertical courses or "chains" with filling between. Both are sound design and good construction. For a wall equally loaded horizontal emphasis in the architectural treatment indicates the aim of the constructor. In a wall loaded at intervals by beams or trusses, vertical piers, "chains," or rusticated artistically indicate the need for solid supports at these points.

Horizontal bond has been exaggerated in some Italian buildings by the use of coloured bands of marble, and the loss of unity is a loss to design. On the other hand, horizontal bond has been used in the constructive materials only, as in the tile and concrete walls of the Romans, and the sheeting has obscured the construction.

In dealing with "chains" or rusticated the height of the courses is governed in many cases by the filling, *e.g.*, an exact number of brick courses. The projections of the alternate stones must also be in accordance with the filling, *e.g.*, a certain number of half bricks, or the normal bond of the ashlar facing. Rusticated at quoins or "long and short work" should begin and end with long stones.

In any one building there will be walls of several thicknesses. The determination of thickness results from varied elements which may be summarised as follows:—(1) The exigencies of construction, (2) the exigencies of climate, (3) obtaining an effect or desired appearance, (4) the consequences of an architectural decoration.

(1) CONSTRUCTION.—Walls must resist actions which tend to crush or to overturn them. Crushing forces tend to act vertically, overturning forces by pressure. Vaults which exert pressure often have other vaults counteracting the inclined forces produced, and the two



neutralise each other, thus producing a vertical load. Other forces, like the thrust of roof trusses on external walls, have nothing to counteract their thrust except the wall construction. The exact dimensions of walls supporting loads should never be guessed or judged or obtained by empirical rules, unless the dimensions of exactly similar walls have been firmly established by practice. The calculation of crushing and overturning forces belongs to the study of construction and not to design. We are only concerned here with the effect produced upon the design by the requirements of construction.

Generally speaking, internal walls will be in equilibrium, or nearly so, except walls carrying roofs on one side without ties, or vaults in similar circumstances. External walls are rarely in equilibrium, and for this reason, and as a protection against heat and cold, they are generally thicker than interior walls. In the interior it is necessary to distinguish between walls that carry weight and those which are merely partitions. Walls subject to unusual conditions, such as walls carrying flues or chimney-breasts, must be the subject of special study. The thickness is also determined by the material. Thus in a stone wall there may be walls of 1 ft., 1 ft. 6 in., or 2 ft. in thickness, but in brickwork the thicknesses will be 1 ft. 1½ in., 1 ft. 6 in., 1 ft. 10½ in., or 2 ft. 3 in. Intermediate sizes will never be used because of the wastefulness caused in their construction. Similarly piers, and if possible openings in brick walls, will be made equal in width to brick dimensions, and will cease to be governed by the needs of design once their general proportions are settled. In isolated walls the thickness alone may be insufficient to keep them in equilibrium, and they may be reinforced with piers or counterforts. These piers or counterforts rendered necessary by construction may become the salient features of the design.

(2) CLIMATE.—At first sight it does not seem as if climate should influence the thickness of

walls. One of the functions of a wall is, however, to protect man against dangerous and inconvenient conditions of the atmosphere, and therefore thick walls have a distinct office in hot and cold countries. Only in temperate countries is this protection unnecessary. Cold and heat are only two qualities of atmosphere; they have an accompanying corollary, viz., light. In cold countries light is generally bad and thick walls obscure light. Clothes and fires can be used as a protection against cold, and we do not therefore find thick walls in cold countries; but in hot countries light is blinding, heat is great, walls are the best protection, and so we find thick walls and small openings for windows and doors. To these is added in certain cases the loggia, and we have three distinctive features of the architecture of all hot climates.

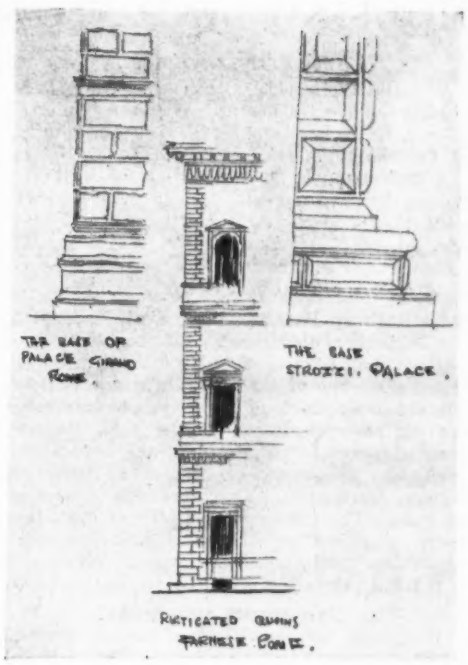
(3) EFFECT.—The thickness of walls will often be governed more by the creation of a desired effect than by construction. A thick wall with deep openings for doors and windows creates richness and monumental feeling. All of us have been struck by the beauty of the thick walls which characterise powerful architecture, giving play to light and shadow. These effects are quite legitimate when economy is not of primary importance.

(4) ARCHITECTURAL DECORATION.—Often the walls of buildings are sensibly thicker than is required by construction, climate, or effect by reason of the architectural decoration or treatment adopted. Thus at the base of a building there will often be a plinth, and above the plinth may be a pedestal or a basement story. Most important of all there may be a treatment of pilasters or free columns which will require considerable additions to the thickness of the lower part of the structure. This treatment now tends to be absorbed by steel construction, but it still renders necessary the use of piers of substantial projection. Typical examples of such treatment will be found at the Louvre and Palais de Justice in Paris, and parts of Somerset House, the Banqueting Hall, University College, and other buildings in London.

CHARACTER IN WALLS.—Character in walls depends more than anything else upon the choice of material. Thus it may be red, brindle, or stock brick, rubble (squared or otherwise), plaster, cut stone, granite, or marble. The effective treatment of these materials will of itself create a fine architectural exterior. Architectural features may be applied to such walls, some of which will be discussed later under the heading of "Doors and Windows," "The Orders," &c.

There are four constructive parts of walls—(1) foundations, (2) plinths, (3) surface proper, (4) cornice. The three last form the basis of wall decoration.

The plinth is primarily a constructional feature, providing an additional thickness at the base and adding to the solidity of the wall. Its constructional function must be expressed in its treatment. It should be simple, have an aspect of solidity, few joints and bold mouldings. Excellent examples exist in the Parthenon, the Palais Giraud in Rome, and the Strozzi Palace, Florence. On the surface of the wall itself the constructional purpose should be expressed in the decoration. Rusticated quoins emphasise the importance of the angle and indicate its structural value, as at the Farnese Palace, and many other buildings. Channelling and rustications add to the solidity of appearance of points of support or to the lower stories of the building, and in such buildings as the Strozzi and Riccardi Palaces at Florence give enormous value to the wall surface. String-courses provide a method of emphasising horizontal lines. For this reason they should invariably be placed at points

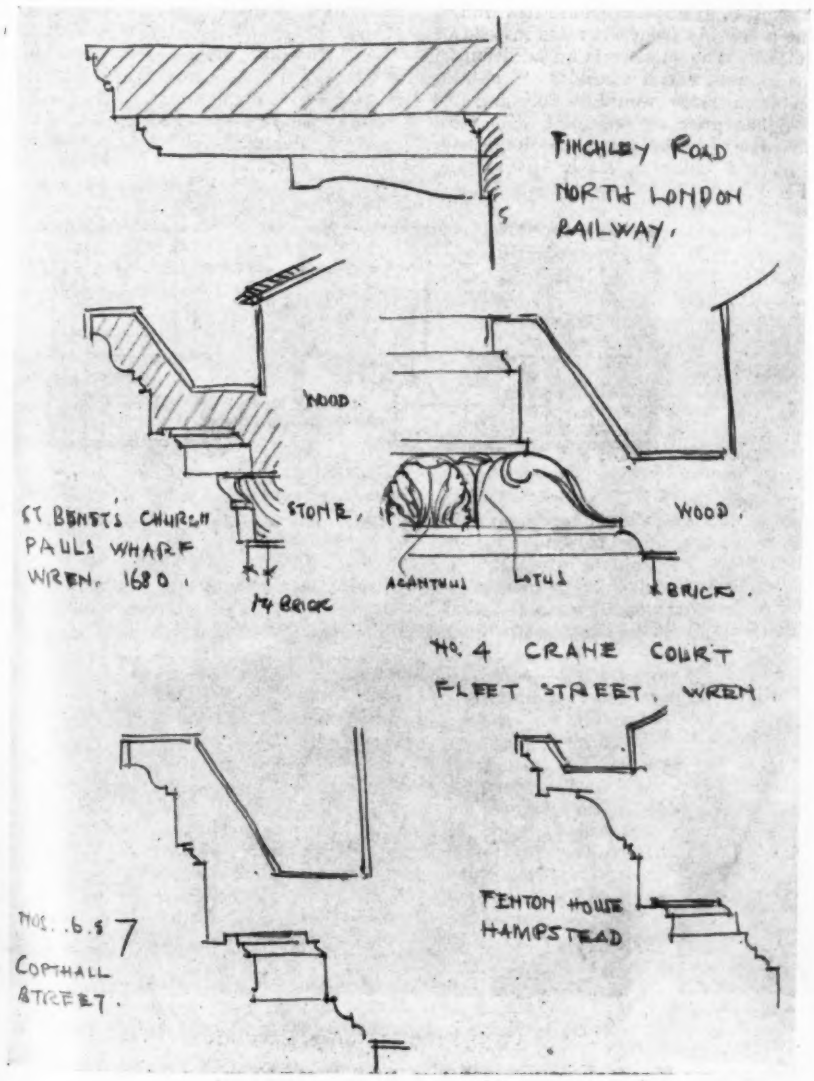


which are structurally important, viz., floor levels or sill levels. The most important string-course is that crowning the basement of the building, and may be richly treated either flat with carved ornament (as at the Pandolfini Palace, Florence), or with frieze and mouldings added (as at the Farnese Palace). No string-course should equal in importance the cornice.

The cornice arose structurally from the need for keeping the wall watertight. Its typical element is the drip. It protects the face of the wall as well as its top, and therefore is given considerable projection. The Gothic cornice is shallower because of the steep slope of the roof behind. The modillion, and still more the truss, help to give the Classic cornice its great importance. The cornice may be constructed of brick, stone, wood, plaster, sheet-iron, or copper, and its detail will be affected by the material adopted. Points which should receive special attention are:—(1) The position of the horizontal joints, (2) the position of the vertical joints, (3) the shape of the parts of the soffit, (4) the use of the soffit for absorbing small projections, (5) the arrangements of modillions around angles.

The handling of the gutter has considerable influence on the form of the cornice. It may be an eaves gutter forming the top member, a cast-iron or bronze gutter above the cornice and visible as part of the decorative scheme, a lead gutter sunk in a wood cornice, or it may be hidden behind a blocking course. The cornice is the most important element in Classic design. It is valuable to study the refined lines of the Greek examples, the strong character of the Roman, and the interest and variety of the Renaissance. The Florentine palaces are worthy of particular study. In London excellent examples exist in the Athenæum Club, the Travellers' Club, the Reform Club, and the Carlton. A guide to the correct proportions of the cornice may be obtained by subdividing the entablature into ten parts giving four to the cornice, or making the cornice two-twenty-fifths of the full height of the building. The proportions of a few well-known cornices are as follows:—Palazzo Spanochi at Sienna three-thirty-sevenths total height, Pal. Picolomini two-twenty-sevenths, Pal. Pojama one-fourteenth, Pal. Strozzi two-twenty-ninths, Villa Montecchio one-fifteenth, Pal. Farnese one-seventeenth, Pal. Gohdi two-twenty-fifths. Where there is a basement the height is measured from the top of the platt hand.

The cornice may not project more than 2 ft. 6 in. over the public way in London.



HOUSING AND TOWN-PLANNING NOTES.

Lower Prices for Houses.

The Old Fletton U.D.C. has accepted, and the Ministry of Health has approved the tender of Messrs. J. Cracknell and Mr. T. Measures, jointly, of Peterborough, amounting to £14,957, for 16 "A" class and 16 "B" class houses, including paths, fences, and all drains, which equals £424 17s. 6d. for "A" class houses and £509 18s. 9d. for "B" class houses, subject to fall in wages. The architects are Messrs. Bowden & Abbott, of 31, Craven-street, W.C. 2.

N.E. Railway Housing Scheme at Darlington.

The tender of Messrs. J. Laing & Co., of Carlisle, has been accepted for the Darlington housing scheme of the North-Eastern Railway. The scheme consists of 200 houses to be erected for the accommodation of the N.E. Railway men who will be employed at the new wagon works now in course of erection at the Faverdale Estate, Darlington. The work will commence at once. The drawings and bills of quantities were prepared in the N.E.R. Architects' Dept. at York, by Mr. Stephen Wilkinson, F.R.I.B.A., the Chief Architect to the Company.

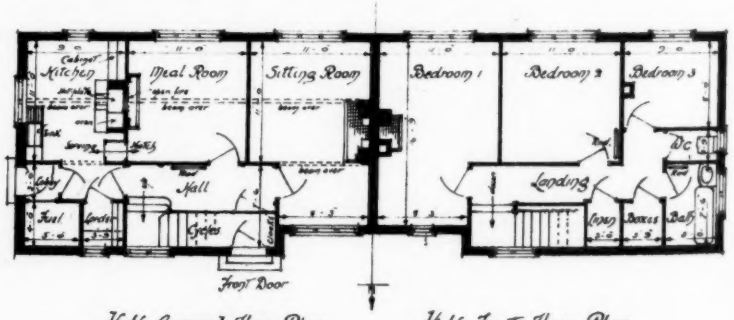
New Houses and Rating.

Reporting to the London County Council on the question as to whether any housing schemes in London are in danger of being abandoned or seriously delayed owing to the withdrawal of the Government subsidies, and, if so, whether housing could be facilitated and unemployment diminished by arrangements being made that, in consideration of any fresh housing schemes being proceeded with during the next twelve months, some equitable adjustment of the rateable value of the new accommodation should be secured for a limited number of years until the capital outlay incurred had been reduced to a reasonable extent, the Housing Committee of the Council points out that the Increase of Rent, etc. (Restrictions), Act, 1920, provides that the gross value at which new houses may be assessed shall not exceed the rent actually charged, that is to say, the assessment is not to be based on the full economic rent which the tenant would be prepared to pay during the period of shortage of housing accommodation. The basis of actual rent charged is also higher than the basis on which existing houses are assessed, which is generally that of the pre-war rents, and, generally speaking, new houses are assessed by comparison with the assessment of pre-war houses. New houses bring with them their quota of local expenditure, and the amount thereof is affected by two considerations. First, the cost in the early years while the houses, roads, etc., are new, should be less under certain heads than the normal cost; and second, the aggregate cost of local services ought not to be increased in direct proportion to new houses, as the new houses are largely required to provide for a shifting of population from other districts in which the cost of local services should be, to some extent, reduced. In practice, however, the increase in local cost is very substantial. Moreover, where the new houses are considerably below the average as regards rateable value per head of population, the cost of local services is probably in excess of the rates derived from such houses and the excess therefore becomes a charge on the existing ratepayers. The proposal to exempt all new houses would, of course, throw further additional charges on existing ratepayers, both in respect of housing schemes of local authorities and houses erected by private builders. Exemption from rates of schemes undertaken by local authorities would have the same broad effect of making the existing ratepayers pay for the benefit of new houses as the method of charging the deficiency on the rates direct. In London, exemption in the case of a borough council scheme would throw the charge on the county to the extent of the central rates (which in recent years have formed from about 62 to 77 per cent. of the total), so that, although a scheme was intended for the benefit of the locality, its exemption would result in a charge mainly on the county as a whole. On the other hand the exemption of a Council scheme in London would throw the charge on the borough or union to the extent of the local rates and, as a scheme designed to serve a larger area, would place an undue burden on the locality. In the case of a scheme undertaken by the Council outside London, the exemption would throw the charge on the outside ratepayers. Even with exemption from rates the financial result would still show a large deficiency to be otherwise met. On the whole, the Committee states, so far as the schemes of local authorities are concerned, the more equitable and fairer course is to show a deficiency on working and to charge it upon the rates of the local authority concerned. As regards houses erected by private enterprise, exemption from rates would, in effect, be a subsidy from the rates instead of from the taxes. The subsidy is an addition to the price or the rent which a builder can obtain. Exemption from rates would enable him to obtain a higher price or a higher rent than would otherwise be the case. Both should, therefore, have a similar effect in encouraging building, though the more direct and tangible subsidy would probably have a more certain result. Since May, 1920, the State subsidy has been £230 to £260 per house, according to floor space. The exemption of new houses of a similar class from rates for a period of 10 years would, on the basis of the present assessment and rates, be equivalent to a subsidy of nearly £200 per house.

PAIR OF HOUSES AT GREAT MISSENDEN.

The pair of small houses illustrated on this page have been erected at South Heath, Great Missenden. The first estimate, in brick, with external roughcast and ordinary plaster internally, including drainage and paths, amounted to £2,400, but by substituting asbestos-faced "Hurcan" slabs for all walls and partitions, and eliminating the plastering, a saving of £300 was effected. Complete half-inch scale detailed elevations were prepared of all walls and partitions, showing the size and position of each slab, which materially assisted the rapid erection of the houses. They were begun on May 16 and completed and occupied by August 23, little more than thirteen weeks from the cutting of the first foundation trenches. The first floors throughout are open timber framed, with 1 in. grooved-and-tongued boarding. The first-floor ceilings are panelled out with asbestos sheets, distempered ivory white. All woodwork has been treated with two coats of "Soligum" instead of paint. The roof is covered with selected old pantiles. The fire-places in the sitting-room and large bedroom are of special 6 by 2 multi-coloured sand-faced bricks, with raised hearths and shelves of quarry tiles. The combined central heating and cooking apparatus fixed in each house between the kitchen and meal room, with open fire to the latter, supplies three radiators and the domestic hot-water supply by contact with a copper coil in the feed tank, ensuring a constant supply of hot water day and night for the sink, bath, and lavatory.

Mr J Harold Sayner, A.R.I.B.A., of Great Missenden, is the architect. Messrs. H. J. & A. Wright, of Great Missenden, were the contractors. The "Hurcan" slabs were supplied by Messrs. Bell's United Asbestos Co., Ltd.; and the heating and cooking apparatus was supplied and fixed by the Hot-Water Stove Co., of Guildford, Surrey. Messrs. Hall & Co., of Croydon, supplied and fixed the old pantiles.



SOUTH ELEVATION.

NORTH ELEVATION.

Pair of Houses at Great Missenden. MR. J. HAROLD SAYNER, A.R.I.B.A., Architect.

LAW REPORTS.

Destruction of a Mansion by Fire.

In the Court of Appeal last week (before Lords Justices Bankes, Atkin and Younger), the hearing was concluded of the case of Waring & Gillow, Ltd., *v.* Doughty on the appeal of the defendant from a judgment of Mr. Justice Sankey on an issue submitted to him in the action. The plaintiffs were employed by the defendant, who had purchased a Georgian manor house at Ickleford, near Hitchin, to redecorate and alter it in accordance with his requirements, and the whole house was given over to the plaintiffs for this purpose. During the process of redecoration the house was almost totally destroyed by fire. The plaintiffs by the action claimed to recover £4,400, the amount of their account, and the defendant counterclaimed for £25,000, the value of the mansion, and for two further items of £1,000 and £5,000 for work already done and expenditure incurred. The defendant also claimed damages for loss of the use and occupation of the property for twelve months, and estimated the value of this at £3,000.

The issue on the case before the judge was whether the plaintiffs were legally responsible for the fire, which it was said broke out in a bedroom where the plumbers had a fire. Mr. Justice Sankey held that the fire did break out in that room, and that it was caused by some timber in the room becoming ignited. His lordship further held that there was nothing improper *per se* in the use of a bedroom as a plumber's shop, that the fire was not a roaring one, and that there was no negligence in what the plaintiffs or their workmen had done. He accordingly entered judgment for Messrs. Waring & Gillow on the issue submitted to him, with costs, and from this decision the defendant now appealed..

Mr. Cyril Atkinson, K.C., and Mr. H. M. Giveen appeared in support of the appeal; and Mr. T. Hollis Walker, K.C., and Mr. A. M. Woodgate appeared for the respondents.

Their lordships allowed the appeal with costs. Lord Justice Bankes, in giving judgment, said plaintiffs were put upon inquiry as to the condition of things in the bedroom when the plumber's fire was lighted. It was said that orders were given that there should have been a complete examination. The man sent to investigate, finding an iron bar at the existing opening of the fireplace, took the view that there would not be an oak lintel supporting the brickwork. If the plaintiffs had sent a man to investigate who knew his business instead of being put off his guard by the presence of the iron bar, he would have been put on his guard. The man they deputed to make the examination made a wholly insufficient one. In the circumstances, he thought the judgment of Mr. Justice Sankey must be reversed, and judgment entered for the defendant on the issue as to the responsibility for the fire. The other members of the court concurred.

Builders' Liability to Rates.

At the Manchester City Sessions, on February 25, Mr. Sandbach, sitting as Deputy Recorder, read the judgment of the Recorder (Mr. A. J. Ashton, K.C.) in a number of appeals by builders and contractors against assessments to poor rate made by the Manchester Overseers. The firms concerned were Messrs. Tinker & Young, Ltd.; Messrs. Normanton & Sons, Ltd.; Sir Robert McAlpine & Partners; Messrs. Jackson Brothers; Messrs. Robert Carlyle & Co.; Messrs. J. & H. Bardsley; and Messrs. G. & W. Smith. They were represented by Mr. Moxon, and Mr. J. E. Balmer appeared for the Overseers.

Mr. Moxon stated that in all twenty-eight appeals had been entered, but when the matter was argued before the Recorder on January 18 and 19 it was arranged to take eleven, which should be regarded as test cases; and the others would abide by the decision. The facts in those seventeen cases had not been gone into. He suggested that they should be withdrawn.

Mr. Balmer said if the matter went further he might want to refer to the seventeen other cases.

It was agreed that the seventeen appeals in question be respited to next sessions.

In his written judgment the Recorder said the Manchester Corporation, pursuant to authority given to them by the Ministry of Health, were, at all times material to the appeals, laying out large estates for the purpose of providing houses. Contracts were made with various contractors, some of whom were the appellants. In all cases but one they erected on the building sites a series of buildings, such as a store-house, a mortar-mill, a joiners' shop a canteen house, which were necessary for the completion of the work which they had undertaken. In one case, they utilised for similar purposes a building used for a saw-mill on land belonging to the Corporation, adjoining but not actually upon the building site. In his opinion this case stood upon the same footing as the others. The Overseers had rated all these contractors to the poor rate in respect of the various buildings on the ground that they were in beneficial occupation, and the contractors had appealed. In his opinion, none of them was liable to be so rated, and all the appeals must be allowed, subject to a case which he would state for the opinion of the King's Bench Division of the High Court if so desired.

The principle on which the cases must be decided was stated by Lord Sumner (then Mr. Justice Hamilton), in Young & Co. *v.* Liverpool Assessment Committee (1911, 2 K.B., p. 195). It was that, in determining whether there was exclusive occupation of the premises, or only a licence to use them subject to control, three things must be considered: (1) the nature of the business carried on and the purpose for which they were placed in possession; (2) the instrument itself and its terms; and (3) the state of the facts with regard to the buildings and the user of them. In the present cases, the state of the facts with regard to the buildings and the user of them was agreed between the parties; they were all substantial buildings and none of them was a chattel. The user was ancillary to the main purpose of the building scheme. Whether as shops, or store houses, or offices, or engine houses, they were all solely used for the purposes of the work done upon the building site. It was expressly provided that the contractor should not use the land or premises for any other purpose. They were all upon Corporation land; they were placed where the City Architect directed by clause 23; they became the property of the Corporation, together with all the plant and materials required for the work. No work was to be done at night or on a Sunday, except when permitted or required by the City Architect. Under those circumstances it appeared to him that the contractors never had any exclusive occupation of the buildings, but were there as mere licensees for the purpose of carrying out their contracts. In every twenty-four hours they came and went, and for more than half the total number of hours in the week they were off the site altogether. Such discontinuous possession deprived the possibility of exclusive occupation by the contractors. In other words, the Corporation were the proper persons to have taken proceedings for trespass against third parties.

It remained to consider whether the whole contract disclosed that, under all the circumstances, the occupation of the contractors was paramount and that of the Corporation subordinate. In his view under the terms of the contracts the occupation of the Corporation was paramount. For the Overseers it was argued that the contractors, having got possession of a site for the purpose of erecting works, had taken a portion and put it to a more definite use, and, in fact, by the buildings they erected and the uses they put them to, they got such an occupation of the site that they were rateable in respect of the separate building. The argument was that a licence followed by user might create rateability, and it seemed reasonable enough. But licences varied indefinitely. In the Chelsea case (5 Barnewall and Adolphus and Holywell *v.* Halkyn (5 Appeal Cases), there was continuous and uninterrupted user of the ground occupied by a pipe in one case and by a tunnel in the other. In the present case the contractors were licensed to build on other people's ground with other people's materials under the control of other people at specified times. The circumstances of each case had to be separately considered, and here the hereditaments in question might at any time have had to be given up owing to default of the contractors on other parts of the building estate.

For those reasons the appeals must be allowed with costs and the rate in each case quashed.

Mr. Balmer (for the Overseers): I ask that a case may be stated.

The Deputy Recorder: Yes.

OLD LONDON BRIDGE.

A MEETING of representatives of professional societies, City Companies, and others was held at the Concrete Institute, Dennison House, Vauxhall Bridge-road, on Monday last, to discuss proposals for the preservation of the newly-discovered arch of Old London Bridge. Mr. W. J. H. Leverton, a member of the Council of the Concrete Institute, who occupied the chair, said the object of the meeting was to take steps to preserve the arch, which dated back to 1176, and he suggested that Sir John Burnet & Partners, the architects in charge of the new building, and the owners be asked to delay operations for a time; also, that the Trustees of the Bridge House Estates be asked to provide the necessary funds for the work of preservation.

Mr. Halsey Ricardo, representing the Civic Arts Association, said his Society was heartily in sympathy with the proposal and especially that the arch should be preserved *in situ*.

Mr. Herbert A. Cox said it was the arch and not the extensions—which were only about 150 years old—which they wanted to save. He thought if a support to the building were put right through the arch it would not materially injure the structure for those who were interested in it.

Mr. C. F. Latham, F.R.G.S., suggested that if it were impossible to preserve the arch as it stood all the stones should be numbered and the fabric re-erected in St. James's Park, or some other suitable position over moving water.

Mr. W. E. A. Brown said he thought a public appeal should be made to the citizens of London, and a visit to the Bridge arranged, as the people did not realise its historical value. The cost of preservation would be probably about £7,000. There was a second arch, which was not yet uncovered; and if both could be preserved for posterity so much the better.

Mr. E. Fiander Etchells, President of the Concrete Institute, amplified the foregoing opinions, and suggested that the arch be re-erected in a museum, or that the stones be numbered and stored, in the hope that some more public-spirited people might come along and re-erect the arch.

Captain H. L. Thomson was of opinion that it was not only a national possession but an imperial one, and if the money for its preservation were not forthcoming an appeal might be made to the Colonies.

After further discussion a resolution was passed expressing the opinion of the meeting that the arch should be preserved in its present position and every effort should be made to attain that object.

[In a letter to *The Times* on Monday last, Mr. C. F. Latham suggested that the most suitable place for the re-erection of the arch would be in the centre of the grounds of Lancaster House.]

The Royal Society of British Sculptors.

At a general assembly of the Royal Society of British Sculptors the following elections took place: President, Mr. W. Reynolds-Stephens; Vice-President, Mr. F. W. Pomeroy, R.A.; Treasurer, Sir Thomas Brock, K.C.B., D.C.L.

THE BUILDING TRADE.

THE OUTLOOK IN THE BUILDING INDUSTRY.

We have received the following letters on the present position in the building industry:—

Sir,—From the various articles and letters which appear in the Press one would imagine that the cessation of building generally, and of house building in particular, is the direct result of the war, and that the only obstacles to the revival of the building trade are high wages, small and restricted output on the part of the workers, and combinations to keep up the prices of materials and fittings—all these are assumed only to have existed since the war. These things have existed and will always exist in any trade under certain conditions, but they are not in themselves sufficient to stop building, and the public are being misled by the majority of the writers.

Everyone knows, or should know, that house-building ceased to be profitable many years before the war. In 1901 the building trade employed over 720,000 skilled men, 640,000 in 1911, 423,000 in July, 1914, and 324,000 in 1920. The drop between 1911 and 1914 is more than double that during the war, and from 1901 to 1914 treble. Housing fell off in proportion. The Land Duty Clauses of "The People's Budget" and the Lumsden judgment cut off the only available method of keeping up the supply of small houses. This method, in brief, was making the price of building land, when developed or partially developed, pay for the loss on the actual building. It was not an ideal system, but under existing conditions was the only expedient.

The Land Duty Clauses have gone (ten years too late), but there is no hope of bringing back the speculative builder. House building and ownership have been so penalised that no sane man would dream of building for investment, and only under exceptional circumstances for any other reason. If he builds a house for himself he has to pay for living in it an amount in rates nearly equal to an economic rent. By building he becomes liable to pay for education, police, unemployment, and other strictly national services for ever.

There is a fairly large section of the community which can just afford to pay an economic rent, but not rates in addition. How are these to be provided for?

The main obstacle to the revival of building is the crushing burden of the rates. No trade can exist under such an unfair impost. The authorities have been aware of the position and the remedy since the year 1900, and failing the speedy application of the latter, the remnants left of the building trade will go.

There is room for employment, if we get back to 1901 conditions, for at least 500,000 men, and at the present time we are losing actual created wealth, the turnover represented by something like two millions a week in wages, and reverting to a worse standard of living than that of 50 years ago.

E. G. Holtom, F.R.I.B.A.

Holt, Norfolk.

Sir,—Having noticed the opinions put forward by Mr. Stranks in your issue for February 24, I venture to think that those of a country builder may also be of interest to your readers. As a class we are not very articulate, but it must not therefore, be, assumed that we are incapable of thinking for ourselves. To many of us it is quite a new experience to find ourselves in violent conflict with our "operatives," but the events of the past few years, when an hysterical boom in trade rushed up wages in some cases to four times their pre-war level, convinced us that it was our duty to the community to do something by co-operation with fellow builders to check this alarming instability in the working conditions of our industry, and we welcomed the Wages and Conditions Council as an effective means to that end.

Personally, I hope we shall ultimately arrive at an average working week of 48 hours (or thereabouts); my own conception is an 8-hour day for six days a week; but why force this at the present time? At the risk of giving away my own side, I must protest against this attempt to rush the situation now that the advantages have swung our way. The recent communications from the National Federation of Building Trades' Employers have set some of us wondering what all the excitement is about, and your correspondent's concluding paragraph confirms our suspicions, while it is encouraging to find our own Regional Federation is not so tame as it is expected to be by the dictators of policy.

In all classes of society there are those who love fighting for its own sake. Surely our noble industry is essentially one of the arts of peace, and therefore cannot be advanced by the tactics of war. We build and create for the welfare of our kind, while the efforts of the warrior, though indispensable when called for, only result in the destruction of human life and enterprise.

With much effort we have built our Wages and Conditions Council, and to us, the unsophisticated, it seems to function perhaps a little too slowly for most builders, but patience is a virtue (which those who delight in unreasonable time limits are apt to forget) and we may as well let the ink dry on the Constitution of our Wages and Conditions Council before we start tearing it up.

F. W. Charman.

Ascot.

Sir,—I was very much impressed by the high tone and spirit of Mr. Laing's letter in your issue for February 10, on an 8-hour day. I think Mr. Laing and Mr. Easten perceive the heart and mind of their employees on this vital question. And the suggestion Mr. Laing makes, that the question should stand over for twelve months, is a very good one; we should then be able to judge more conclusively on this matter.

I am sorry to see the general feeling of the employers in the building trade is a desire for longer hours and to reduce wages; this is exceedingly aggravating to the operatives and the cause of much discontent. I am convinced that if the employers were, as a body, to let these two contentious points stand over as they are for a year it would create a better feeling and bring good results, and would disperse to a great extent the spirit of unrest that is so manifest in our midst to-day.

There are employers who are doing their best to bring about a better feeling between themselves and their workmen. I am working for a London firm that has an excellent canteen and dining-room, and which takes a keen interest in the social welfare of its employees. The firm has established a Works Committee to carry out reasonable improvements and to superintend generally the social welfare of its employees. It has also instituted clubs for football, bowling, cricket and minor sports; it has formed a library of 400 books; and has an excellent band which plays once a week in the dinner hour. A very good concert once a month is arranged for all who wish to attend, and, in addition, the firm invites the children of its employees to a Christmas party which, needless to say, is the great event of the year.

I think, Sir, you will agree with me that if this spirit of social welfare becomes established amongst employers generally, there would be little room for complaint about output. On the contrary, it would bring about the end we have in view, namely, working amicably together for the good of our trade and for the ennobling of us all.

Mark Powell.

THE LONDON BUILDING ACT: ALTERATIONS.

The case we reported in our issue for January 27, in which Messrs. Fellows & Co. were summoned for not having given notice to the District Surveyor of certain work as required by the London Building Act, requires noting. The work in question was stated to be the renewal of the sash and stall-board of a shop front without alteration except that the stall-board was to be reinstated in marble in place of deal, and the sash was to contain one sheet of glass instead of two sheets. The magistrate, apparently on the authority of the case Goddard *v.* Greig (1917, 2 K.B. 397), convicted, fining the defendant £1 and 3 guineas costs.

We commented on the case of Goddard *v.* Greig in our issue for June 15, 1917. In that case the premises had a flat wooden roof which had an outer covering of zinc, and there was a dormer to a staircase which had a covering of felt, and for these coverings a layer of asphalte had been substituted. Section 209 of the London Building Act, 1894, is as follows: "Every addition to, or alteration of, a building, and any other work made or done for any purpose in, to, or upon a building (except that of necessary repair not affecting the construction of any external or party wall) shall so far as regards such addition or alteration or other work be subject to the provisions of this Act and of by-laws thereunder relating to new buildings."

In the divisional court two of the judges held that even assuming the exception as to necessary repair formed an exception to the words "alteration of a building," yet there was evidence upon which the magistrate could hold that the substitution of new material was an "alteration" more than mere repair. The third judge held that the exception of necessary repair applied only to the "other work" mentioned in the section and not to "alterations and additions," and that as the substitution of material was an "alteration" it was not necessary to consider the question of repair at all.

If the matter were not thus covered by judicial decision we think the wording of this section was capable of a more liberal interpretation which would not affect every trifling substitution of material, but, as it is, anyone venturing to substitute any material whatever must give notice under the Act or run the risk of a prosecution. There is an excellent old legal maxim, *de minimis non curat lex*, but this seems no longer to be applicable, for not only does the law care about trifles nowadays, but it also fetters progress and hinders improvement in many directions. A man may hesitate to substitute a new and improved material if he knows that this, however small the operation to be performed may be, will convert what would have been a necessary repair into an "alteration" under all the machinery of the London Building Act.

Neath and District Master Builders' Association.

The Neath and District Master Builders' Association has elected Mr. Thos. Cole as President for the ensuing year, with Mr. S. L. Collins as Vice-President. Other officials elected were:—Treasurer, Mr. T. P. Gower, Briton Ferry; auditor, Mr. T. Evans, Neath; representative on South Wales Joint Industrial Council, Mr. S. L. Collins; South Wales Federation, Messrs. T. Cole, H. Waring, and S. L. Collins.

The Brickmaking Industry.

It is reported that the brick manufacturers of Burscough, Ormskirk, Hesketh Bank, and Croston have decided, owing to the depression in the building trade and the fact that they have large stocks on hand, to close their works for an indefinite period.

THE CONCRETE INSTITUTE.

AT a meeting of the Concrete Institute, held at Dennison House, Vauxhall Bridge-road, S.W., on Thursday last week, MR. H. KEMPTON DYSON read a paper entitled "What is the Use of the Modular Ratio?" The lecturer used a number of diagrams to explain his arguments, which, he said, were intended to throw doubt on the current and generally-accepted theory of reinforced concrete calculations in which the so-called "modular ratio" was so fundamental a factor. The paper was of unusual length, and contained a great many algebraic formulæ and curves which it is impossible adequately to abstract in the space at our disposal.

In the course of some general remarks, he said the modulus of elasticity was often referred to as though it were a constant, *i.e.*, the ratio of the stress to the strain as uniform. For almost all materials the ratio was variable. Steel was a material which, for low stresses, seemed to have almost a constant modulus, the point where there was a distinct departure being known as the elastic limit. At a slightly higher stress there was a very distinct departure, the strain increasing greatly and being largely plastic, giving a "permanent set." That was known as the "yield point." In many practical constructions a certain amount of permanent set was always reckoned upon. With riveted joists, for example, some of the rivets had to give way slightly before the others were brought into play. In comparatively roughly cut wooden joists resting on wall plates which in turn rested on rough brickwork there must be some permanent deformation before they all came into proper bearing. Even in brick and stone work the joints were laid up in soft mortar in order that there might be plastic deformation. Considerable movements were often allowed in brickwork. In ordinary building, therefore, the permanent set was familiar, and confidence was felt as to the stability of the construction when it settled down to its work. The computation of the stresses in materials subjected to permanent plastic deformation had not received sufficient attention. Scientists who had made notable contributions to the mathematical theory of stresses and strains in elastic materials had simplified their mathematics by considering only ideally elastic materials—which would imply ideal conditions.

It had been shown that with ordinary ductile mild steel, if the normal yield point were increased, new and higher yield points might be created by cold working the steel, and so long as any repeated loading did not exceed the new yield point no further permanent set was to be feared.

Concrete had no well-defined yield point like steel; but somewhat similar phenomena were found by causing the material to undergo permanent deformation by repeated loading. By repeated loading the modulus of concrete became much more uniform than appeared from the stress-strain curve for the first time of loading but, nevertheless, the modulus was not constant. Professor Lea, in a paper recently read before the Institute, pointed out that there were two ways of referring to the modulus of elasticity of a curved stress-strain diagram, namely: (1) The average for a certain limit of stress. For instance, if tested in compression up to 1,000 lbs. per square inch, that stress was divided by the total strain up to that point in order to obtain the value of the modulus of elasticity; and (2) the instantaneous value at any particular stress. That was derived by taking the ratio at which the stress and the strain were increasing at any point, and was shown by the tangent to the curve at the point. To distinguish between those two ways of determining the modulus of elasticity, the lecturer pointed out that concrete which might start, for example, with an initial modulus of elasticity of about 4,000,000 lbs. per sq. in. would soon drop off successively to three million, two million, one million and 500,000 pds./in.^{2}. If a point were taken, say, where the instantaneous modulus determined by the tangent to the curve was, say, 1,000,000 lbs. per sq. in., if the stress were divided by the total deformation from the start to that stress a value of 2,000,000 lbs. per sq. in. might be given. That showed the difference between the instantaneous modulus and the average modulus. Generally the modulus was treated as being constant, and for concrete the "average modulus" was adopted.

In the consideration of reinforced concrete beams they were met initially with the fact that what was termed a beam might not be so really. The concrete was ignored in tension because of the stated possibility of cracks extending from the convex side of a so-called "beam," and yet certain modes of calculation were put forward as a means of determining the shearing stresses whereby horizontal shear was required to be transmitted from section to section, forgetting that it could not pass across a crack. In short, the demonstrations were inconsistent. But the trouble was deeper rooted than that. It was not merely the case that the method of determining shear stresses was wrong, but the fundamental assumption about the stresses being directly proportional to the distance from the neutral axis was wrong—again because of the cracks. A reinforced concrete member subjected to transverse loading might, if uncracked initially, start by the strain being directly proportional to the distance from the neutral axis, which would be located not at the ordinary centroid of a homogeneous section but in a position corrected for the steel having a different modulus from the concrete. But though at first a reinforced concrete member might act truly as a beam, the neutral axis of which, allowing for the reinforcement, started at approximately 54 per cent. of the effective depth from the compressed edge, yet as, in order to obtain economy, they naturally reckoned upon putting a fairly high tensile stress into the steel under working loads, the result would be that with quite a moderate stress in the steel the concrete would be cracked on the convex side. These cracks were minute as a rule, so that when air penetrated to the steel no corrosion would take place by reason of the presence of the alkaline lime compounds of the cement. Those cracks were reduced in size and in number by making members fairly deep. After all, the cracks were due in a sense to curvature in bending, and as the deflection varied directly as the cube of the depth it was easy to see that a small increase in depth would make a great difference in the deflection and the radius of curvature. In properly designed reinforced concrete, cracks were very small and might not be noticeable to the naked eye, nor to the casual observer, so that such structural members might appear to be homogeneous units. The fact that cracks did occur, however, rendered the structures really compound ones, in which the concrete and steel acted as separate elements, though connected together. Thus, in reality, such a member was not a beam—it was more in the nature of an arch or elemental frame.

Engineers were not very sure as to how a so-called "beam" of reinforced concrete was really going to act: it might be a sort of arch, or a simple frame, or a truss. When, indeed, it came to building a slab to rest on its edges there might be developed a sort of flat dome or a cone or pyramid. As to how much of the concrete was cracked throughout the length of the beam could not be determined with any accuracy. When the concrete cracked, the steel reinforcement would slip through. Tests had shown a gradual sliding of the bars in the concrete, as the loads had increased, until most of the pull was taken by the hooks or other anchorages at the ends. For the first time of loading the action was altogether different from what it was when cracking had occurred. Towards the ends, therefore, of a "beam" there might be uncracked sections in which the distribution of stress would be very different from that in a frame. They could not know at all precisely the actual distribution of the deformation or strain throughout the member; consequently they had no means of determining except in the roughest manner the amount of work done. Even to make a rough approximation, it would be necessary to look closely into the detail of every design. It seemed, therefore, impractical to attempt to get a solution by the theorem of least work. The theorem of least work was only a variation of the principle of minimum energy, which was adopted for the solution of unknowns in equations relating to all sorts of problems.

It was only within the past few years that he had been able to arrive at a simple mode of calculation which was considered to be sufficiently accurate for all practical purposes and to be free from the mathematical inconsistencies of the current theory.

In reinforced concrete calculations, as customarily performed, they were familiar with the fact that a formula for the strength of reinforced concrete beams had been worked out on various assumptions in which a co-efficient was inserted to express certain relations, that being the so-called modular ratio. Loading tests on beams had been conducted, and from the records of such experiments a value had been adopted for that co-efficient for the particular quality of concrete employed, and for moderate amounts of steel which fitted the formula somewhat to the experimental results of those tests. Surely that was an artifice! It meant that the co-efficient in the formula was derived empirically. The ordinary formula was called rational, as distinct from empirical, but if the reasoning was not logical, and the assumptions did not fit the facts, then it was hardly rational, and seeing that dependence was placed upon a co-efficient derived from experiments, it would be permissible to refer to the whole method as empirical.

The majority of bending tests on reinforced concrete members were on sections reinforced with a small percentage of steel, namely, 1 per cent. or less. With such a limit the reinforcement was the weaker element, and the compression could be safely carried on a small top boom of concrete. Experiments showed that whenever small percentages of steel were used with a fair quality concrete the so-called neutral axis travelled upwards, indicating that a smaller and smaller area came into play to resist the compression. Naturally, if the reinforcement was weak it would be stressed beyond the yield point, and would begin to deform plastically, with the result that the beam would go on deflecting, the radius of the curvature would increase, and cracks open wider, making the area left to take compression less. When rupture finally occurred in such cases they did not, as a rule, find the steel snapped apart, nor, indeed, on examination of the steel out of broken beams did they notice any stricture or waist. The bars, when tested, appeared to be as good as before. They found, therefore, on ultimate rupture, that it was the concrete which appeared to be crushed on the concave side whereas the steel was really the primary cause of failure. By the ordinary theory, if the steel became overstrained its apparent modulus would be lowered. In a beam weak in tension that meant that the modular ratio would tend to be reduced. A lower modular ratio meant that the neutral axis would rise. So far the ordinary theory agreed, but while the steel was stretching the area in compression was being reduced, and the concrete must be having its modulus reduced also. The modular ratio was therefore an unknown quantity. But so far as small percentages were concerned there was no need to import such a factor into the equations for determining the ultimate strength. They had a sufficient criterion in the fact that the total compression must always equal the total tension. It looked as though Nature enabled an adjustment to take place so as to assist the overstrained steel as much as possible, throwing on the stronger element of concrete a bigger share until finally that as the less ductile material crushed. The steel was really the primary cause of failure owing to its weakness, but when ultimate failure did occur, both the concrete and steel were taking the maximum they were capable of developing.

OUTDOOR RELIEF AND UNEMPLOYMENT DOLES.

AT a private conference recently held at Lambeth, where 22 Metropolitan Borough Councils, 3 County Borough Councils, 3 Municipal Borough Councils, 21 Urban District Councils, and 4 Rural District Councils were represented, a resolution, afterwards published, was adopted on the subject of unemployment, urging the Government "to reverse its present wasteful method of dealing with unemployment and to adopt a constructive policy of instituting useful work and laying the foundations of a scheme of prevention."

The resolution was a long one, and we only refer to that portion of it which relates to the at present totally unproductive expenditure on relief without work. Although many persons seem under the impression that some sort of Government dole is still being administered, that is, of course, not the case. There is unemployment benefit under the Unemployment Insurance Act during certain periods when the funds admit of distribution, but that is only paid to persons who have themselves when in work contributed to the insurance scheme. It is the outdoor relief at present being granted by the guardians, with certain recognition on the part of the Government, which raises the serious questions touched upon by this resolution. Outdoor relief is the rule now and not the exception, and no one will insist that the genuine worker out of employment should be forced into the workhouse, but it is not only the idea of the workhouse which has gone, but it is the work as well, and it is the granting of unemployment pay with no conditions attached to it whatever which raises the most serious question with which we are now confronted. Unemployment allowances under such conditions are a dole and nothing but a dole. They discourage initiative and energy, and thus encourage unemployment in two ways; they increase the rates and thus tax those in work and the productive sources of the country, and they encourage those out of work to acquiesce in their condition of inactivity. Those who have had experience in administering workmen's compensation can speak with authority on this second point. Many men who had suffered injury and who were far from being guilty of any desire to malinger were prone, as would be the case in nearly every human being, to put off the painful effort, often involving real physical suffering, of getting back to work so long as they received sums as compensation which enabled them "to rub along." The gradual lowering of the weekly payments by the arbitrators, in most cases gave the man the necessary incentive to make a beginning, and he gradually returned to working at his full capacity.

No such check accompanies the present grants of outdoor relief; so long as a man is unemployed he gets full relief and has to make no return for it. In thousands of cases, of course, the man is really desirous of getting work and does his utmost, but in numberless cases only a pretence is made of seeking work, and the real object is only to obtain a certificate which will satisfy a Labour Exchange. In some cases, we believe, an unqualified person will apply for a post requiring some qualifications simply in order to obtain a written refusal of services to present to the Labour Exchange. Whether or not the Labour Exchanges can sift all such cases we do not know, and we must not be taken to make any reflection on Labour Exchanges, but the point we do make is that pay without work and without any restrictions attaching to its receipt will ruin the nation and demoralise the workmen. The benefit clubs run by workmen, for workmen, recognise this principle to the full; for a man in receipt of sick pay is placed under severe restrictions—he must not go farther from his house than a certain distance, he must not be out of doors after certain hours, and so on.

It is essential that some restrictions and some work should be attached to the receipt of outdoor relief. It may be difficult to comply with the resolution we allude to above and to provide productive or even "useful" work, but some work should be required, or failing this some restriction on recipients should be enforced, unless the moral of the nation is to be undermined by relief.

WORKMEN'S COMPENSATION STATISTICS.

A WHITE Paper, containing statistics as to workmen's compensation, dated December, 1921, has just been issued for the year 1920. These tables of statistics were suspended owing to the war from 1914 to 1919, and they are still published in an abbreviated form. Complete statistics are only available in the seven great industries which make returns, *i.e.*, shipping, factories, docks, mines, quarries, constructional work, and railways. The aggregate number of persons employed in these industries in 1920 was 8,348,150; the total compensation paid them amounted to £5,978,009; and the charge for compensation averaged 14s. 4d. per head. The average payment in case of death was £214; and in case of disablement, £13 14s. In 1914 the corresponding amounts were £161 and £6 7s.; the War Additions Acts no doubt accounting for this increase.

Although the actual payments for compensation for fatal and non-fatal accidents amounted to £5,978,009, it is estimated that if all the charges, *i.e.*, administrative expenses, medical and legal expenses, commissions, profits, &c,. are taken into account, the total charge for compensation in these seven industries alone amounts to not less than £8,500,000.

There are certain general statistics contained in the report which are not confined to the seven named industries; thus it states that the number of original claims for compensation settled with the cognisance of the courts was 3,389, and in 2,737 of these, or 81 per cent., the decision was in favour of the workman. There were, of course, many applications dealing either with allowances or other matters and many cases were settled, and to acquire any idea from the tables of the decrease of litigation all these proceedings have to be considered. In 1913 they numbered 10,254, whereas in 1920 there were but 5,331. These figures exclude memoranda of agreements registered, which numbered 25,332 as against 32,390 in 1918. There seems, therefore, some reason for thinking that at last most points arising under this complicated legislation have been decided in principle, but as the present Act has been in force since 1906 it has taken many years. The Rent Acts have, we think, caused quite as much litigation in each year as did the workmen's compensation legislation, but it is to be hoped the Rent Act may be repealed before its intricacies are unravelled by years of litigation, such as has taken place in connection with workmen's compensation since it was first introduced in 1897.

The workmen's compensation legislation has, however, displaced to a great degree the far more complicated proceedings under the Employers' Liability Act, 1880. The cases under this latter Act have fallen from 223 in 1911 to 69 in 1920, and it may be noted that of these 69 actions under the Employers' Liability Act 14 were connected with the building trade. In this trade there were 376 applications for arbitration, and 1,598 memoranda were registered. In the building trade, under the heading, "Building: House Painting," we find there were 42 certificates given in respect of disablement or suspension from industrial diseases; of these, 37 cases were lead poisoning, 2 cases dermatitis, one case ulceration of the skin, one case ulceration of the corneal surface of the eye, and one case inflammation of the synovial lining of the wrist joint and tendon sheaths.

In conclusion, the report states that the number of cases carried to the Court of Appeal under the Act was 82, or 2·4 per cent. of the cases decided by the courts below (meaning the arbitrators), and there were in addition 10 appeals to the House of Lords.

NEW BUILDINGS IN LONDON.

WEST CENTRAL.—Extensive alterations are now proceeding at the Scala Theatre, Charlotte-street. The reconstruction work comprises chiefly the taking out of the old gallery and erecting in its place a new upper circle providing seating accommodation for about 480 persons, which will be furnished with tip-up plush seats. The projector, originally in the dress circle, will be removed, and a new projection room built on the roof. The foyer is also to be reconstructed and brought up-to-date. The architect is Mr. Frank Verity, A.R.I.B.A., of 7, Sackville-street, W.1. The builders are Messrs. Arthur Vigor, Ltd., of 20, Knightsbridge, S.W.

HOMERTON.—The Hackney Borough Council is erecting twenty-four slipper baths by direct labour on a site on the corner of Wardle-street and High-street, having an area of approximately 70 ft. by 21 ft. The building will have a single floor and will be fitted with pay boxes, boiler-house, w.c.'s, &c. The Borough Engineer, Mr. Norman Scorgie, has prepared the plans, which show a steel frame fireproofed with brickwork. Sub-contracts have been placed as follows: Steelwork, Messrs. Lindsay's Paddington Ironworks, Ltd., 15, North Wharf, W.2; lantern lights, Messrs. Henry Hope & Sons, Ltd., 59, Berners-street, W.1; heating, Wright's B.T.V. boilers; lighting, &c., The Gas Light & Coke Co., Ltd. The contract is estimated to cost about £3,800.

CAMDEN TOWN.—The demolition of the interior and ground floor frontage has now commenced at the premises on the corner of High-street and Kentish Town-road. They are to be reconstructed as a new branch for the London Joint City & Midland Bank, Ltd. The new building will have a steel frame, by Messrs. Moreland, Hayne & Co., Ltd., fireproofed with brickwork, and a front of stone. The ground floor will be of marble on the public side of the counter, and oak wood blocks in the banking house, manager's room, &c. The other floors will be of reinforced granolithic. The architect is Mr. T. B. Winney, F.R.I.B.A., of 8, Old Jewry, E.C. The builders are Messrs. T. Rider & Sons, of 181, Union-street, S.E.1. Sub-contracts for heating, window lights, &c., have not yet been decided.

WALWORTH.—Preliminary demolition work has commenced in connection with the erection of a new garage for Mr. W. R. Woods, adjoining his existing premises in Hampton-street. The new building will have an approximate frontage of 36 ft. and a depth of about 150 ft. The plans prepared by the architects, Messrs. George Lansdown & Brown, of 9, Regent-street, W.1, show a 2-story building with a steel frame fire-proofed with brickwork and reinforced concrete floors. The main contract is being carried out by Messrs. Holliday & Greenwood, Ltd., of Stewart's-road, Battersea, S.W.8. The steelwork will be supplied by Messrs. Drew-Bear, Perks & Co., Ltd., of 110, Cannon-street, E.C. 4. It is understood that further developments and extensions are contemplated at a later date.

WEST CENTRAL.—Rapid progress is being made with the excavations and foundations for the large extensions to Messrs. Bourne & Hollingsworth's premises in Oxford-street. The site for the new building adjoins the existing premises and has frontages of 106 ft. by 90 ft. to Berners-street, 100 ft. to Castle-street, and 51 ft. to Wells-street. The plans have been prepared by the architects, Messrs. John Slater & Keith, of 46, Berners-street, and the main contract has been secured by Mr. F. G. Minter, of Ferry Works, High-street, Putney. The plans show a steel frame and brickwork with stone frontages to be installed by the contractors, and it is understood a section of the buildings will have four floors and basement, and others five floors and basement. The following sub-contracts have been placed and others are under consideration:—Floors: Messrs. Diespeker & Co., Ltd., 60, Holborn

Viaduct, E.C.1; windows: Messrs. Henry Hope & Sons, Ltd., 59, Berners-street; steelwork: Messrs. Moreland, Hayne & Co., Ltd., 80, Goswell-road, E.C.1; lifts: Messrs. Waygood-Otis, Ltd. The demolition work, etc., is being carried out by Mr. Henry J. Greenham, of Rosebank Wharf, Fulham.

A new Institute of Medical Sciences is being added to the University College Hospital in Gower-street. The site for the new building adjoins the existing premises, and has a frontage of 157 ft. and an approximate area of 11,350 sq. ft. The plans, prepared by Mr. F. M. Simpson, F.R.I.B.A., of 80, Gower-street, show a building of three floors having a steel-frame fireproofed with brickwork and frontages of Bath and Portland stone. The floors are to be of concrete. The main contract has been secured by Messrs. J. Carmichael, of 331, Trinity-road, S.W.18. The steelwork is being supplied by Messrs. Dorman, Long & Co., Ltd., 4, Central Buildings, Westminster. Other contracts have yet to be decided.

LAMBETH.—A new employment factory for the blind is now under construction on a site occupying Nos. 252-260, Waterloo-road. The new building has a frontage of 82 ft. and a return of 60 ft. It is composed of basement, ground, first, and second floors, which will be fitted as workshops and offices. The plans have been prepared by Messrs. W. H. Woodrofie & Son, of 5, Bedford-row, W.C. Brick construction is being employed with stone front up to first floor level and a back staircase of stone supplied by the Patent Victoria Stone Co., Ltd., of Stratford. The main contractors are Messrs. S. E. Wallis & Sons, of Maidstone. The floors will be of reinforced concrete surfaced with Stewart's granolithic. "Dreadnought" fire-proof doors are being installed; lifts by Messrs. Waygood-Otis, Ltd.; hot-water installation by Messrs. G. N. Haden & Sons, of Lincoln House, Kingsway, W.C. 2

THE WEST SURREY BUILDING TRADES' EMPLOYERS' ASSOCIATION.

THE West Surrey Building Trades' Employers' Association held its second annual dinner at Guildford, on Wednesday last week. The President, Mr. R. H. Tribe, presided, and supporting him were Mr. C. Lynn, F.I.O.B. (President of the Southern Counties Federation), Councillor W. E. Collier, J.P. (Senior Vice-President), Mr. G. A. Hotter (Secretary, Southern Counties Federation of Building Trades' Employers), Councillor H. M. Lunn (Mayor of Guildford), Councillor H. Fitton-Adams (Mayor of Godalming), Councillor H. E. Smith, Mr. J. H. Howard, and Mr. C. E. C. Lowry.

Proposing the health of the Southern Counties Federation, the Chairman said in the conference shortly to take place with regard to a longer working week and a further reduction and adjustment of working conditions, their representatives would express the unanimous wish of the Southern Counties Federation that those proposals should come into operation without further undue delay, and enable prospective building owners to put in hand the work waiting to be done.

In acknowledging the toast, Mr. Lynn said amongst the matters of importance in the southern area was the division of decorators and painters into two grades. Whatever might be the result in March, the Federation would not let the question drop until it secured the satisfaction it required.

Councillor Collier also acknowledged the toast.

Mr. Hotter proposed "The West Surrey Building Trades' Employers' Association," and congratulated it on increasing its membership by nearly 50 per cent.

Councillor H. Fitton-Adams responded.

Replying to the toast of "The Visitors," the Mayor of Guildford emphasised the importance of increasing output, the lack of which was taking business away from the building trade. That state of things was detrimental to builders and operatives and the general public.

RATES OF WAGES IN THE BUILDING TRADE.

The following are the rates of wages in the building trade in England and Wales. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers	Slaters	Plumbers.	Painters.	Masons' Labourers.	Bricklayers' Labourers.	Plasterers' Labourers.
Aberdare	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Accrington	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Altrincham	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Ashton-under-Lyne	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Barnsley	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Barrow-in-Furness	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Barry	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Bath	1/9	1/9	1/9	1/9	1/9	1/9	1/9		1/4½	
Bedford	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Birkenhead	2/2	2/2	2/2	2/2	2/2	2/2	2/2		1/9½	
Birmingham	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Bishop Auckland	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Blackburn	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Blackpool	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Bolton	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Bournemouth	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Bradford	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Bridgwater	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½	1/6½		1/2½	
Brighton	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Bristol	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Burnley	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Burton-on-Trent	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Bury	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Cambridge	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Cardiff	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Chatham	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Chelmsford	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Cheltenham	1/9	1/9	1/9	1/9	1/9	1/9	1/9		1/4½	
Chester	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Chesterfield	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Colchester	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Coventry	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Crewe	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Darlington	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Derby	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Doncaster	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Dudley	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Durham	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
East Glam. and Mon. Valleys	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Exeter	1/8	1/8	1/8	1/8	1/8	1/8	1/7		1/3½	
Folkestone	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Gloucester	1/9	1/9	1/9	1/9	1/9	1/9	1/8		1/4½	
Grantham	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Grays	2/0	2/0	2/0	2/0	2/0	2/0½	1/11		1/7	
Grimsby	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Great Yarmouth	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Guildford	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Halifax	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Harrogate	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Hartlepools	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Hastings	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Hereford	1/9	1/9	1/9	1/9	1/9	1/9	1/8		1/4½	
Huddersfield	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Hull	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Ipswich	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Lancaster	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Leamington Spa	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Leeds	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Leicester	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Lichfield	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Lincoln	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Liverpool	2/2	2/2	2/2	2/2	2/2	2/2	2/2		1/9½	
Llanelly	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
London	2/0	2/0	2/0	2/0	2/0	2/0½	1/11		1/7	
Loughborough	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Luton	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Maidstone	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Manchester	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Mansfield	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Merthyr Tydfil	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Middlesbrough	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Newcastle-on-Tyne	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Newport, Mon.	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Northampton	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Norwich	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Nottingham	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Oakham	1/9	1/9	1/9	1/9	1/9	1/9	1/9		1/4½	
Oldham	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Oxford	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Plymouth	1/10	1/10	1/10	1/10	1/10½	1/10	1/9		1/5½	
Pontypridd	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Portsmouth	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Preston	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Reading	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Rochdale	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Rochester	1/7	1/7	1/7	1/7	1/7	1/7	1/7		1/3	
Rugby	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
St. Albans	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
St. Helen's	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Scarborough	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Sheffield	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Shrewsbury	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Southampton	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Southend-on-Sea	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Southport	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
South Shields	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Stockport	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Stockton-on-Tees	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Stoke-on-Trent	2/0	2/0	2/0	2/0	2/0	1/11	2/0		1/7	
Stroud	1/8	1/8	1/8	1/8	1/8	1/8	1/7½		1/3½	
Sunderland	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Swansea	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Taunton	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Torquay	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Tunbridge Wells	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Wakefield	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Walsall	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
Warrington	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
West Bromwich	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Wigan	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Windsor	1/8	1/8	1/8	1/8	1/8	1/8	1/8		1/3½	
Wolverhampton	2/0	2/0	2/0	2/0	2/0	2/0	2/0		1/7	
Worcester	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	
York	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½		1/5½	

(For rates of wages in the Building Trade in Scotland, see page 354.)

NEW INVENTION.

BRICK WALL CONSTRUCTION.

BY JAMES R. HOUSTON, A.R.I.B.A.

EVERY age since the world began has had its housing problem in some form or other. Prehistoric man had his trouble in selecting a site which would afford most protection from wild animals and from the inclemency of the weather. The lone shieling of the misty Isle of Skye and the beehive huts of Lewis mark another stage in the progress towards the solution of the housing problem. The "Building Acts" of Augustus, Nero and Trajan are authentic proofs that Roman civilisation had its problems to face no less than our savage ancestors. The French Revolution was caused, among other reasons, by the awful housing conditions of the people. The Housing Department of the Ministry of Health is fully alive to the needs of our times, and its "Building Acts," like those of the Roman Emperors, reveal to us a keen desire to remove from our midst a social evil which, if left to itself, would have fostered the spirit of revolution. The real problem before us now is to provide suitable homes at economic prices. During and immediately after the war material was scarce and labour at a premium. Housing, in common with other requirements, was at an inflated value. Material is now abundant and labour much cheaper, yet houses cannot be supplied at prices to induce the speculative builder to erect them—a practice which was both common and profitable twenty years ago. Every device is being tried to improve the housing conditions generally, and much inventive genius is being displayed towards reducing the cost to an economic level; and every credit is due to anyone who can unfold a scheme which saves 40 per cent. of material and so builds 60 per cent. more houses with a given quantity of bricks. Such is the scheme about to be explained, and it needs no statistician to understand all the economies effected, as the simplicity of the device is apparent even to those uninitiated in the mysteries of building. Principal Laurie (Heriot-Watt College, Edinburgh), who recently gave an interesting address to the Royal Academy of Arts on "Sand-Lime Bricks" (reported in *The Builder* for December 9, 1921), is the inventor of the system, and after a careful scrutiny of the ideas shown one must admit that the keynote to the whole is economy.

The main object of this invention is to effect a substantial saving in the number of bricks required for construction. The saving on outside walls amounts to 40 per cent. This means increased rapidity of construction owing to fewer delays from failure of brick supply, and increased rapidity of construction means cheap construction owing to increased turnover and diminished running charges. Further, it is claimed that this method of construction is stronger than the present hollow wall construction, as by introducing a wall plate the load of the floors is distributed over the whole wall through the bonding of the piers, while in the present hollow wall construction the whole weight of the floors is carried on the inner wall. At the same time, the system does something to relieve the present shortage of plasterers, as the cement-breeze slabs used for the internal walls require only one coat of plaster as against three coats for bricks. In addition to these advantages, it has been found, on employing a practical builder to put up a wall according to instructions, that the actual cost of the finished plastered wall worked out at 2s. per yard super. less than the cost of the present form of hollow wall being erected.

The method of construction is shown in plan in Fig. 1, in elevation in Fig. 2, and in vertical section in Fig. 3. A 4½ in. wall is built in the usual way, but at stated intervals the bricks are laid in the positions (BB), so as to form piers. A convenient interval between the piers is the length of two bricks, or about 18 ins., thus resulting in a saving of 40 per cent. of the bricks, mortar, and labour required on hollow wall construction. The spacing between the piers may, however, be safely increased to two-and-a-half or even three bricks' length for a two-story cottage. The piers are built with alternate headers, the bond being obtained as shown in Fig. 2.

FIG. 1.

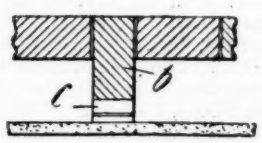


FIG. 2.

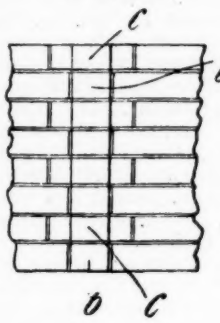
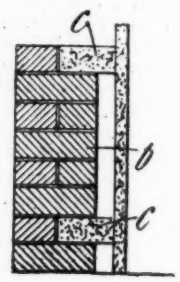
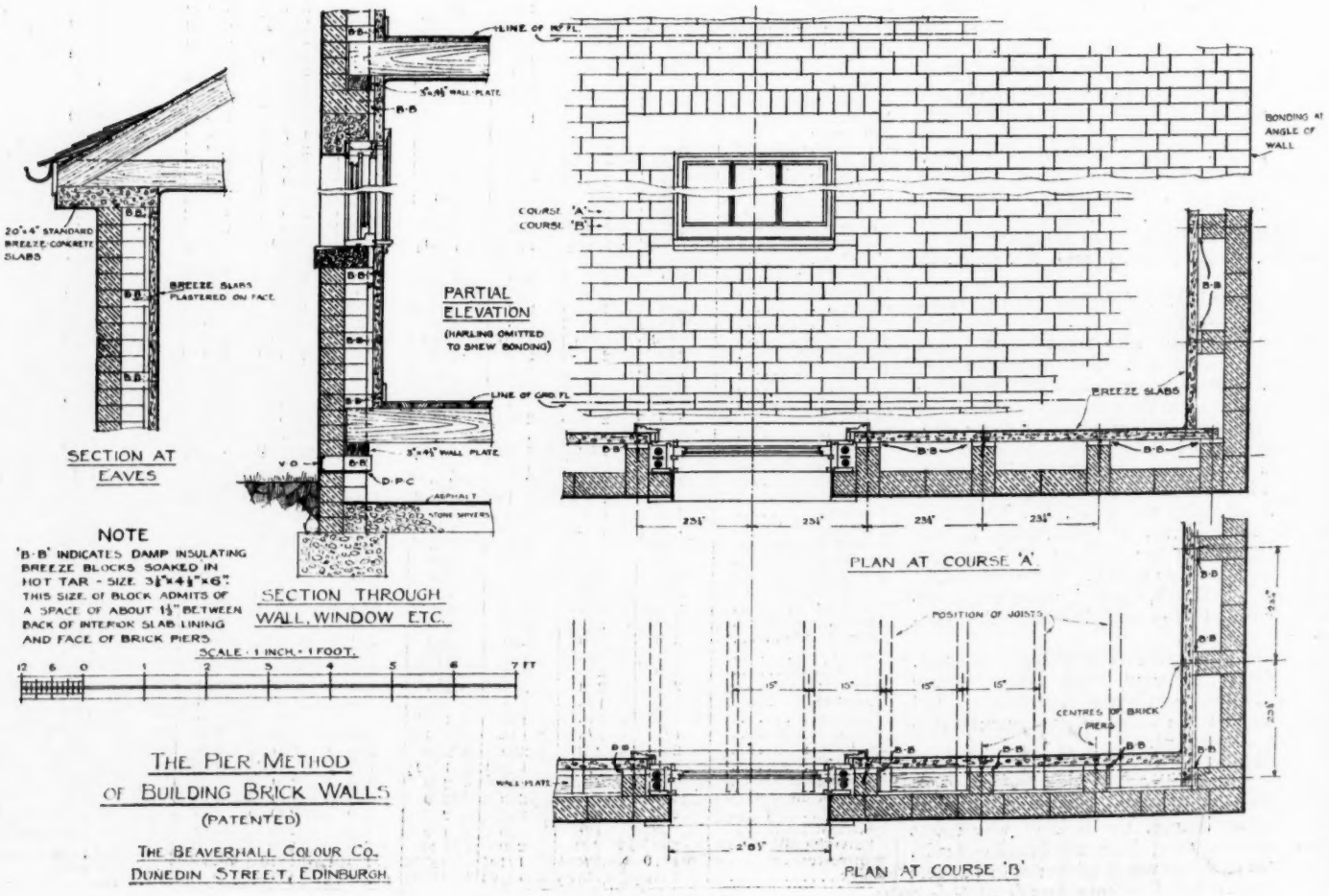


FIG. 3.



In Fig. 3 the pier is shown in vertical section. At intervals, breeze-cement bricks (CC), steeped in tar or bitumen, are introduced. These breeze bricks are moulded 1½ in. longer than half a brick, so as to project beyond the pier. A suitable mixture for these bricks is one of cement to six of breeze. To these breeze bricks the inner lining of the wall is attached by means of cement, nails, or spikes. The inner lining may be any of the well-known linings in use, or may be breeze and cement or breeze and plaster-of-paris slabs, 1½ in. to 2 in. in thickness. By this method of construction, complete insulation from damp of the inner lining is secured.

The plan shows the construction to be adopted at the corners of the building.


SECTION AT EAVES
20"×6" STANDARD BREEZE CONCRETE SLABS
BREEZE SLABS PLASTERED ON FACE
B·B
SECTION THROUGH WALL, WINDOW ETC.
LINE OF 1ST FL.
3"×4½" WALL PLATE
LINE OF GRD. FL.
D.P.C.
ASPHALT
STONE SHIVERS
NOTE
'B·B' INDICATES DAMP INSULATING BREEZE BLOCKS SOAKED IN HOT TAR - SIZE 3½"×4½"×6". THIS SIZE OF BLOCK ADMITS OF A SPACE OF ABOUT 1½" BETWEEN BACK OF INTERIOR SLAB LINING AND FACE OF BRICK PIERS.
SCALE - 1 INCH = 1 FOOT.
12 6 0 1 2 3 4 5 6 7 FT
PARTIAL ELEVATION
(HARLING OMITTED TO SHEW BONDING)
BONDING AT ANGLE OF WALL
COURSE 'A'
COURSE 'B'
BREEZE SLABS
PLAN AT COURSE 'A'
POSITION OF JOISTS
15" 15" 15" 15"
CENTRES OF BRICK PIERS
WALL PLATE
2'0½"
PLAN AT COURSE 'B'

THE PIER METHOD OF BUILDING BRICK WALLS
(PATENTED)
THE BEAVERHALL COLOUR CO.
DUNEDIN STREET, EDINBURGH.

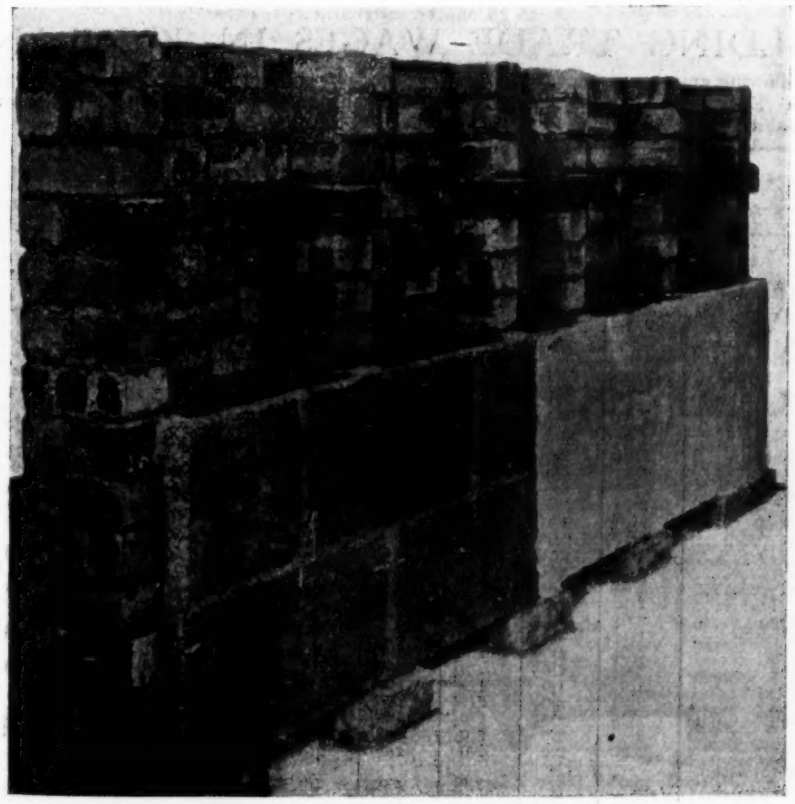
A solid 9 in. by 9 in. column is run up at the corner, with occasional breeze bricks introduced. The breeze slabs on one wall are attached to these breeze bricks.

In building the wall it is only necessary to plumb the outside of the wall. Wherever the breeze brick is introduced the distance from the outside face of the wall to the outer edge of the breeze bricks is measured, thus ensuring that the outer faces of the breeze bricks will be plumb and in line. This is all that is necessary to ensure that the inner lining will also be plumb and in line. If breeze slabs are used for the inner lining they can be attached to the breeze bricks by means of a little cement and an occasional spike or nail.

In considering the cost of construction, on the one hand there is a saving of 40 per cent. on bricks, mortar and labour, and a saving in the cost of plaster, as the breeze slabs only require one thin coat of plaster. Against this has to be set the cost of the breeze slabs and the cost of their erection. An actual wall built on this plan and plastered worked out at 2s. per yard super. (completed and plastered) cheaper than the hollow wall at present being erected. These breeze bricks are cheaply made in a mould, and should not cost more when tarred than an ordinary brick. They are allowed to dry, and then steeped in warm tar. It is evident from these results obtained in practice that apart from the actual saving in bricks used—a very important consideration at present—there is a saving in the cost of construction.

From the foregoing details it is apparent that the method is one worthy of serious consideration by all engaged in housing schemes. The chief advantage of the system is its simplicity, yet the whole idea bespeaks efficiency, and, to suit our present commercial age, the *conditio sine qua non*—economy—has not been forgotten.

This method of construction has been patented and an arrangement has been made between the Beaverhall Colour Co., Ltd., and the inventor of the wall by which the Beaverhall Colour Co., Ltd., has the sole right to issue licences for its erection. A sample wall has been built, and may be seen by appointment at the works of the company in Dunedin-street, Edinburgh.



Experimental Wall on the Pier System.

BUILDING COLLAPSE IN THE MIDLANDS.

IN giving judgment for the defendants in a case in which the widow of a foreman who was killed by the collapse of a building in the Midlands sued the builders for compensation, Judge Ruegg recently said he was satisfied that the work on the building was defective, and there was clearly negligence in the manner in which the work was constructed. That negligence consisted in erecting the coping stones in a dangerous and unsafe method. The only thing which surprised him was that those who were responsible should try to defend the matter. Terrible loss of life had been caused by the accident, and yet those gentlemen did not alter the method of working after the experience they had had, and he gathered that they did not propose to alter it in future. If the same system were adopted they might look for similar accidents, and he did not know how many would be necessary before those gentlemen were convinced that their system was not an efficient system, but was a false and dangerous one. The facts were that without any reason whatever the whole building collapsed, which was in itself the very strongest evidence that something was wrong with the system. The defendants said that a coping stone was tapped by the son of the man who was killed, but surely that was not sufficient to cause the whole structure and foundations to fall down. Houses in the course of erection did not suddenly fall down in the manner in which this building had done if reasonable and proper care were used.

The Judge held that deceased, as the foreman in charge of the work, was the person really responsible for the accident, and that under the Employers' Liability Act compensation could not be obtained through him, and therefore the action failed.

The Price of Iron Pipes.

Mr. Watkin Edwards, the Board's Engineer, reported to the Rhymney Valley Water Board at Caerphilly last week that he had been able to purchase iron water-pipes outside the "ring" at a price which showed a reduction of £2 12s. 6d. a ton on "ring" prices.

THE INSTITUTE OF PLUMBERS.

THE annual general meeting of the Institute of Plumbers was held at Bristol last week.

The President said there was no trade which had the health of the community more in its hands, and plumbers must be worthy of the trust reposed in them. It was for the Institute to uphold the dignity and status of the craft, and to improve its knowledge and workmanship by the better education of the young plumber, particularly through the medium of a sound apprenticeship, and to further the interests of those engaged in plumbing. He deprecated the attitude of master plumbers who averred that operatives were out to get as much money as possible for little work, and protested against the statement of operatives that the master plumbers were only concerned to make as much profit as might be and pay as little as could be. It would be a pity if the Joint Councils were abandoned altogether because they no longer settled wages, as intercourse along the lines of the Joint Industrial Council would be beneficial not only to every district and town but to every firm.

The meeting passed a resolution in support of men affected by silicosis being compensated as in some other diseases.

Mr. G. A. Cox moved a resolution that, whilst agreeing to the principle of every industry making provision in some measure to ameliorate the evils attendant on unemployment, the meeting was of opinion that, in consequence of the want of solidarity and co-ordination of the employing sections of the building industry at the present time, it was inadvisable to proceed with the question until a better understanding could be arrived at amongst the employing section.

After discussion, the resolution was carried with a few dissentients.

The question of amalgamation with the Worshipful Company of Plumbers was referred to, and the conference granted powers to the Executive to negotiate further to see if a basis of agreement could be arrived at.

THE BOURNEMOUTH MASTER BUILDERS' ASSOCIATION.

THE annual dinner of the Bournemouth, Poole and Christchurch Building and Allied Trades' Employers' Association was held last week at Bournemouth. The President (Mr. J. P. Hoare) occupied the chair, and supporting him were the Mayor of Bournemouth (Alderman C. H. Cartwright), Mr. G. Prince (President, Southampton Master Builders' Association), Mr. G. A. Hotter (Secretary, Southern Counties Federation of Building Trade Employers), Alderman Charles Fox, Mr. F. A. Grigg (President-Elect, Bournemouth Association), Messrs R. F. Seward, F. P. Dolomore (Borough Engineer), I. W. Dickinson, E. Brown, and Mr. E. S. Rosevear (Secretary).

In the course of the after-dinner speeches, Mr. F. P. Dolomore said it had been stated that certain officials were in favour of direct labour, and so indirectly to filch what was the builders' province. But it had to be realised that the builder and contractor was a highly technical and skilled man, and to do away with the builder was to do away with the skill that was necessary to success.

Mr. Grigg said he was convinced that direct labour, either by a corporation or by a government, was a failure. He appealed to members of the Association to cut their profits as low as they could.

Mr. Collier said the 44-hour week was uneconomic; it should be extended. There would be greater and better results when they got back to a reasonable working week.

Newcastle-on-Tyne Housing Scheme.

The Newcastle-on-Tyne Corporation Housing Committee has decided to invite tenders for the erection of seventy additional houses on the Walker Estate.

CONTRACTS, COMPETITIONS, &c.

For some contracts still open, but not included in this List, see previous issues. Those with an asterisk are advertised in this number. Certain conditions beyond those given in the following information are imposed in some cases, such as that advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bona-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in; the name and address at the end is the person from whom or place where quantities, forms of tender, &c., may be obtained.

BUILDING AND PAINTING.

MARCH 4.—**Helston.**—HOSPITAL.—Erection of Helston and District Cottage Hospital. Mr. W. J. Johns, Hon. Secretary, Helston.

MARCH 4.—**Salop.**—CONCRETE CONSTRUCTION.—Erection of a new Council School of concrete construction at Macsbury, near Oswestry, for the Salop County Council. Mr. H. E. Wale, Secretary, County Buildings, Shrewsbury. Deposit £2 2s.

MARCH 5.—**Hull.**—HOUSES.—Erection of 74 houses on the West Hull Housing Site, for the T.C. City Architect's Department, Guildhall, Hull. Deposit £2 2s.

MARCH 6.—**Barnet.**—HOUSES.—Erection of 12 houses on the Underhill Housing Estate, for the U.D.C. Mr. W. B. Chancellor, Surveyor, Municipal Offices, Barnet. Deposit £2 2s.

MARCH 6.—**Barnsley.**—OFFICES.—Cleansing, painting and decorating the Borough Police Offices, for the T.C. Borough Engineer, Fairfield House, Barnsley.

MARCH 6.—**Crayford.**—BUILDING, ROADS, SEWERS.—Building of 14 parlour type and 36 non-parlour type houses, including roads and sewers in connection with same, for the Crayford Urban District Council. Mr. Walter F. Bickford, Engineer and Surveyor, Council Offices, Crayford, Kent. Deposit £3 3s.

MARCH 6.—**Lanchester.**—CONVENIENCE.—Erection of public convenience, &c., at Burnhope, for the R.D.C. Mr. J. R. Lupton, surveyor, Lanchester, Durham.

MARCH 6.—**Manchester.**—LYCH GATE.—Erection of a stone lych gate at the entrance to St. Stephen's Churchyard, Audenshaw. Mr. W. Brooks, 136, Trafalgar-street, Ashton-under-Lyne. Deposit, 5s.

MARCH 6.—**Sheffield.**—PAINTING.—For painting at Ruskin Museum, Meersbrook Park, Disinfecting Station, Plum-lane, and dwelling-house, Fulwood-road, for the T.C. Mr. F. E. P. Edwards, City Architect, Town Hall, Sheffield.

MARCH 6.—**Wakefield.**—ADDITIONS.—Alterations and additions to the "Jolly Sailor Inn," Thornes-lane Wharf, Wakefield, for the directors of Clarkson's Old Brewery, Barnsley. Messrs. R. & W. Dixon, architects, 5, Eastgate, Barnsley.

MARCH 7.—**Douglas.**—BRIDGE.—Erection of "Black Boards Bridge." Mr. Robert H. Cubbin, Secretary, 23, Athol-street, Douglas.

✱MARCH 7.—**Leominster.**—HOUSES.—Erection of one block of two houses of the parlour type on the Caswell Fields Site. Hereford Associated Architects, Ltd., Palace Chambers, Hereford. Deposit £1 1s.

MARCH 7.—**Pentrecourt.**—HOUSE.—Erection of house for Mr. R. G. Owen. Mr. R. Jones, architect, Llandyssul.

MARCH 7.—**Southend-on-Sea.**—CONVENIENCES AND SHELTERS.—Supply and erection of men's and women's conveniences at the Old Pier Head, and the supply and erection of shelters on the extension, for the County Borough. Mr. R. H. Dyer, Borough Engineer, Municipal Buildings, Southend-on-Sea. Deposit £2.

MARCH 8.—**Alfreton.**—PICTURE THEATRE.—For erection of a picture theatre at High-street, Alfreton. Mr. John Tomlinson, Victoria-street, South Normanton. Deposit, £3 3s.

MARCH 8.—**Kent.**—COTTAGES.—Erection of thirteen cottages (detached) at East Moor-street Farm, Rainham, Kent, for the County Council. Mr. W. H. Robinson, Architect, Sessions House, Maidstone. Deposit £5.

MARCH 8.—**Manchester.**—CONVERSION.—Conversion of second-class swimming bath into a public washhouse at the Osborne-street Baths, for the T.C. City Architect, Town Hall, Manchester. Deposit £1 1s.

MARCH 9.—**Darlington.**—HOUSES.—For erection of 26 houses on Polam Hill site, for the T.C. Mr. G. Winter, Borough Surveyor, Town Hall, Darlington. Deposit £1 1s.

MARCH 9.—**Rochdale.**—PAINTING.—For painting works at (*a*) Smith-street Baths, internal painting; (*b*) Smith-street Baths, external painting; and (*c*) Castleton Branch Baths, external painting, for the T.C. Borough Surveyor, Town Hall, Rochdale.

MARCH 9.—**St. Helens.**—CHURCH.—Erection of Mission Church, Eccleston Park. Messrs. Biram & Fletcher, architects, 17, George-street, St. Helens.

MARCH 9.—**Southwark.**—ROOF LIGHTS.—Taking off old lantern lights over laundry and adjoining roofs and fixing roof lights at the Southwark Hospital, East Dulwich-grove, S.E., for the Board of Guardians. Steward of the Hospital. Deposit £1.

MARCH 10.—**Canterbury.**—HOUSES.—Erection and completion of 12 houses to be built in pairs on land situated in Mandeville-road, St. Dunstan's, Canterbury, for the County Borough Council. Mr. F. H. Dore, 25, Watling-street, Canterbury. Deposit £1 1s.

MARCH 10.—**Greenwich.**—HOUSING.—For erection of 80 houses on Charlton Housing Estate, for B.C. Town Clerk's Department, Town Hall, Greenwich. Deposit £2 2s.

MARCH 10.—**Hants.**—REPAIRS AND MATERIALS.—Works contracts from April 1, 1922, at various stations in the North Aldershot Royal Engineer District of the Aldershot Command. Royal Engineers' Office, Marlborough Lines, North Aldershot, Hants.

MARCH 10.—**Kilwinning.**—ROOFING.—Renewal of the roofing of retort house and coalshed with galvanised corrugated iron or corrugated asbestos sheeting, for the Gas Co. Manager, Kilwinning Gas Works.

✱MARCH 11.—**Margate.**—CLEANING, &C.—Cleaning and painting work at Princess Mary's Hospital, Cliftonville, for the Metropolitan Asylums Board. Office of the Board, Embankment, E.C.4. Deposit £1.

MARCH 11.—**Oldbury.**—HOUSES.—For the erection of 52 houses at Londonderry-lane in the adjoining U.D. of Oldbury, for the Corporation of Smethwick. Mr. Alex. Hosken, Borough Engineer, Smethwick. Deposit £1 1s.

MARCH 13.—**Ardwick-le-Street.**—HOUSES.—Erection of 20 houses, for the U.D.C. Mr. G. Gledhill, Surveyor, Council Offices, Ardwick. Deposit £5.

✱MARCH 13.—**Brighton.**—BATHING PAVILIONS.—Construction and erection of 12 Bathing Pavilions (each containing four cabins) and 99 Bathing Chalets on the foreshore, at Brighton. Boro' Surveyor, Town Hall, Brighton.

MARCH 13.—**Buxton.**—ALTERATIONS.—For alterations to the Ashwood Park Hotel, for the T.C. Mr. F. Langley, Borough Engineer, Town Hall, Buxton.

MARCH 13.—**Carlisle.**—PAINTING.—For painting and decorating at Fusehill House, for the Board of Guardians. Mr. George Armstrong, architect, 24, Bank-street, Carlisle.

MARCH 13.—**Church Hill.**—SCHOOL BUILDINGS.—Erection of Keelogs (No. 2) National School buildings, near Church-hill, Co. Donegal. Rev. J. Dunlevy, Termon, Letterkenny.

MARCH 13.—**Leeds.**—REPAIRS, &C.—Repairs to buildings and furniture, for the E.C. Architect's Section, Education Department, Calverley-street, Leeds.

MARCH 13.—**Rotherham.**—HOUSING.—For erection of 76 houses on Section B. of the Doncaster-road housing site, for the T.C. Mr. C. A. Broadhead, architect, St. George's Hall, Rotherham. Deposit £2 2s.

MARCH 13.—**Strabane.**—RE-ERECTION.—For taking down and re-erecting portion of goods shed at Strabane Station, for the Great Northern Railway (Ireland). Mr. J. B. Stephens, Secretary, Amiens-street Station, Dublin. Deposit £1 1s.

MARCH 14.—**Chesterfield.**—PICTURE HOUSE.—For erecting new "Victoria" picture house and billiard saloon, for Victoria Enterprises, Ltd. Mr. W. Cecil Jackson, surveyor, 6, Stephenson-place, Chesterfield. Deposit £2 2s.

✱MARCH 15.—**Clacton-on-Sea.**—BUILDING.—New residence at Clacton-on-Sea, to be completed by August 19, 1922. Mr. G. H. B. Gould, architect, Station-road, Clacton-on-Sea. Deposit £1 1s.

MARCH 15.—**Heanor.**—HOUSES.—For erection of 10 houses at Plumptre Terrace site, Langley Mill, for the U.D.C. Mr. A. G. Wheeler, architect, Eastwood. Deposit, £1 1s.

MARCH 16.—**Gillingham.**—CONVENIENCE.—Erection of a convenience at Old Brompton, for the T.C. Mr. John L. Redfern, Borough Engineer, Gillingham. Deposit 10s. 6d.

MARCH 18.—**Gloucester.**—ALTERATIONS.—For alterations to the Nurses' Home, Russell-street, Gloucester, for Gloucester District Nursing Society. Messrs. Vale & Kingsford, surveyors, St. Aldate-street, Gloucester. Deposit, £2.

✱MARCH 20.—**Ringwood.**—COTTAGES, &C.—Erection of three pairs of cottages, one single cottage, piggeries, &c., and for work to existing buildings, at "Sabines' Farm." Mr. A. L. Roberts, County Architect, The Castle, Winchester. Deposit £1 1s.

MARCH 21.—**Lewisham.**—CHIMNEY.—Erection of a brick chimney shaft upon prepared foundations for their dust destructor at Home Park Depôt, for the B.C. Town Hall, Catford (Surveyor's Department).

✱MARCH 21.—**Marlborough, Wilts.**—ERECTION.—Erection of a telephone repeater station, for the Commissioners of H.M. Works. Contracts Branch, H.M. Office of Works, King Charles-street, London, S.W.1. Deposit £1 1s.

✱MARCH 21.—**Southport.**—EXTENSION.—Extension of the Post Office for the Commissioners of H.M. Office of Works. Contracts Branch, H.M. Office of Works, King Charles-street, London, S.W.1. Deposit £1 1s.

MARCH 21.—**Sydenham.**—CHIMNEY SHAFT.—Erection of a brick chimney shaft upon prepared foundations for dust destructor at Home Park Depot, for the Borough of Lewisham. Surveyors' Department, Town Hall, Catford, S.E.6.

MARCH 24.—**Hammersmith.**—HOUSES.—Erection of 30 or 39 houses on their Wormholt Housing Estate, for the B.C. Mr. Leslie Gordon, Town Clerk, Town Hall, Hammersmith, W.6. Deposit £2 2s.

MARCH 29.—**London.**—POLISHING FLOORS.—For floor polishing at various London buildings, for H.M. Office of Works. Contracts Branch, H.M. Office of Works, King Charles-street, London, S.W.1.

MARCH 30.—**Dorchester.**—HOUSES.—Erection of blocks of semi-detached parlour-type and non-parlour type houses on the Victoria Park Site, for the T.C. Mr. S. A. Jackson, architect, Dorchester.

NO DATE.—**Dudley.**—REINSTATEMENT.—Taking down existing engine-house, boiler seatings, chimneys, &c., at Deepfields Pumping Station, near Bilston, and erection of engines foundations, house, and boiler seatings at Waterfall-lane Pumping Station, Old Hill, Staffs. Mr. S. B. Priest, Trindle House, Dudley.

NO DATE.—**Haigh.**—CONVENIENCES.—Erection of conveniences for High Village Institute. Secretary, Haigh, near Barnsley.

NO DATE.—**Hintlesham.**—PAINTING, &C.—For repairing, cleaning, and re-decorating Hintlesham Church. Mr. W. E. Turner, Hintlesham.

FURNITURE, MATERIALS, etc.

MARCH 4.—**Goole.**—ROAD MATERIAL.—Supply of road materials to the R.D.C. Mr. R. Plewes, Surveyor, 4, Belgravia, Goole.

MARCH 4.—**Nuneaton.**—GRANITE.—For supply of broken granite for one year, for the Bulkington U.D.C. Mr. C. Blakeway, Clerk, 2, Church-street, Nuneaton.

MARCH 4.—**Pontardawe.**—MATERIALS.—For supply of road and other materials for one year, for R.D.C. Mr. B. I. Phillips, Engineer, Council Offices, Holly-street, Pontardawe.

BUILDING TRADE WAGES IN SCOTLAND.*

THE following are the present rates of wages in the building trade in the principal towns of Scotland. Every endeavour is made to ensure accuracy, but we cannot be responsible for errors that may occur:—

	Masons.	Bricklayers.	Carpenters, Joiners.	Plasterers.	Slaters.	Plumbers.	Painters.	Masons'	Bricklayers' Labourers.	Plasterers'
Aberdeen	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/7	1/5½ to 1/6½		
Airdrie	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		
Alexandria	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½		1/7½		
Arbroath	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	1/5½		
Ayr	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/5½ to 1/6½		
Bathgate	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/5½ to 1/6½		
†Blairgowrie	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	—	—		
Bo'ness	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/-	1/8		
Coatbridge	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		
Dumbarton	2/0	2/0	2/0	2/0	2/0	2/0	1/9	1/7½		
Dumfries	1/10	1/10	1/10	1/10	1/10	1/11½	1/8	1/4½	1/4½	1/5½
Dundee	2,0	2/0	2/0	2/0	2/0	2/0	1/9	1/7		
Dunfermline	2/0½	2/0½	2/0	2/0	2/0½	2/0½	—	1/7½		
Duns	1/6	1/6	1/6	1/6	1/6	1/6	1/6	1/0		
Edinburgh	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		
Falkirk	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		
Fort William	1/10	1/10	1/10	1/10	1/10	1/10	1/10	1/2½		
Galashiels	1/11½	1/11½	1/11½	1/11½	1/11½	1/11½	—	—		
Glasgow	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/7½		
Greenock	2/0½	2/0½	2/0	2/0	2/0½	2/0	1/9	1/4½ to 1/7½		
Hamilton	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	1/9	1/7½		
Hawick	1/10½	1/10½	1/10½	1/10½	1/10½	1/10½	1/8	1/3½		
Helensburgh	2/0½	2/0½	2/0	2/0½	2/0½	2/0	1/9	1/7½		
Inverness	1/11½	—	‡	1/7	1/6½	1/9	1/6	1/0½		
Kilmarnock	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	2/1	1/7		
Kirkcaldy	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/6½		
Kirkwall	1/9	1/9	1/9	1/9	1/9	1/9	—	1/2		
Lanark	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7		
Motherwell	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		
Perth	2/0	2/0	2/0	2/0	2/0	2/0	1/9	1 6½		
Stirling	2/0	2/0	2/0	2/0	2/0	2/0	2/0½	1/7		
Stirlingshire (Eastern District)	2/0	2/0	2/0	2/0	2/0	2/0	1/9	1/7		
Wishaw	2/0½	2/0½	2/0½	2/0½	2/0½	2/0½	—	1/7½		

* The information given in this table is copyright. The rates of wages in the various towns in England and Wales are given on page 351. † For housing work only; for other work, Masons 1/8, Painters 1/7, Labourers 1/- to 1/4. ‡ Under unemployment relief scheme, 11d.

MARCH 4.—**St. Thomas.**—MATERIALS.—Supply of road materials to the R.D.C. Mr. J. S. Madge, Surveyor, Brooklands, Heavitree, Exeter.

MARCH 4.—**Southend.**—MATERIALS.—For supply of road and other materials for one year, for T.C. Mr. R. H. Dyer, Borough Engineer, Southend-on-Sea.

MARCH 4.—**Stafford.**—GRANITE.—For supply of granite and slag, for one year, for R.D.C. Mr. W. Blackshaw, 3, Crabbery-street, Stafford.

MARCH 6.—**Billericay.**—MATERIALS.—Supply of road materials to the R.D.C. Mr. F. E. Ennals, Surveyor, Sheeley-road, Hutton, Essex.

MARCH 6.—**Caerphilly.**—MATERIALS.—Supply of limestone metalling, distilled tar, &c., to the U.D.C. Mr. T. H. Richards, Surveyor, Caerphilly.

MARCH 6.—**Earsdon.**—ROAD MATERIALS.—For supply of road materials for one year, for the U.D.C. Mr. J. R. MacMillen, Surveyor, Council Offices, Shiremoor.

MARCH 6.—**Edinburgh.**—GRATES.—For supply and erection of ranges, grates and mantel registers for 90 tenement houses at Willowbrae-road. Mr. J. D. Gibson, surveyor, 60, Frederick street, Edinburgh.

MARCH 6.—**Loughton.**—MATERIALS.—Supply to the U.D.C. of (1) 5,000 gallons of refined tar; (2) 100 tons of granite chips, ½ in. to dust. Mr. Horace White, Surveyor, Loughton, Essex.

MARCH 6.—**Morley.**—MATERIALS.—Supply of highway materials to the T.C. Mr. F. Turner, Borough Engineer, Town Hall, Morley.

MARCH 6.—**Newmarket.**—ROAD MATERIALS.—Supply of road materials to the R.D.C. Major S. J. Ennion, Clerk, Newmarket.

MARCH 6.—**Ormskirk.**—MATERIALS.—Supply of road materials, tools, &c., to the West Lancashire R.D.C. Mr. R. Rosbotham, Town End, Ormskirk.

MARCH 6.—**Stoke-on-Trent.**—MATERIALS.—Supply of road and other materials to the T.C. Borough Surveyor, Town Hall, Stoke.

MARCH 6.—**Warrington.**—CEMENT.—Supply to the T.C. of 300 tons of Portland cement. Mr. Andrew M. Ker, Borough Engineer, Warrington.

MARCH 7.—**Chingford.**—ROAD MATERIALS.—Supply to the U.D.C. of road materials and the use of steam roller, &c. Mr. L. C. Bowen, Clerk, 34, Station-road, Cmngford, E.4.

MARCH 7.—**Derby.**—MATERIALS.—Supply of road and other materials to the T.C. Mr. C. A. Clews, Borough Surveyor, Babington-lane, Derby.

MARCH 7.—**Greenwich.**—ROAD MATERIALS.—Supply of road materials to the B.C. Borough Engineer's Office, Town Hall, Greenwich-road, S.E.10.

MARCH 7.—**Littleborough.**—MATERIALS.—Supply of highway materials, to the U.D.C. Mr. George H. Wild, Surveyor, Council Offices, Littleborough.

MARCH 7.—**London.**—MATERIALS.—Supply to the Metropolitan Asylums Board of oilman's goods, painters' colours, window glass, &c. Office of the Board, Embankment, London, E.C.

MARCH 8.—**Bristol.**—BUILDING MATERIALS.—For supply of building and other materials for 3 months at various institutions, for the B.C. Mr. J. J. Simpson, Clerk, St. Peter's Hospital, Bristol.

MARCH 8.—**London.**—ROAD MATERIALS.—For the supply and delivery of road materials (granite, gravel and ragstone) to the Royal Parks, for the Commissioners of H.M. Works, &c. Contracts Branch, H.M. Office of Works, King Charles-street, London, S.W.1.

MARCH 8.—**Macclesfield.**—SUPPLIES.—Supply of paints, &c., glass and electrical goods to the Cheshire County Mental Hospital. Mr. W. G. F. Tingay, clerk, Hospital, Parkside, Macclesfield.

MARCH 8.—**Oldham.**—MATERIALS.—Supply of road and other materials, to the T.C. Borough Surveyor, Town Hall, Oldham.

MARCH 9.—**Hendon.**—MATERIALS, &C.—Supply to the R.D.C. of road materials. Mr. H. W. Rackham, Council Offices, Stanmore.

MARCH 9.—**Rochford.**—TAR.—Supply of 50,000 galls. of tar; also sand, to the R.D.C. Surveyor, 40, Clarence-street, Southend-on-Sea.

MARCH 9.—**Thakeham.**—MATERIALS.—Supply of basalt, granite, flints and tar to the R.D.C. Mr. W. Forrester, Surveyor, Storrington, Pulborough.

MARCH 9.—**Warwick.**—MATERIALS.—Supply to the C.C. of main road material. Mr. D. H. Brown, County Surveyor, 6, Northgate-street, Warwick.

MARCH 10.—**Bristol.**—MATERIALS.—For supply of electric and gas fittings and glass at various institutions for 3 or 6 months, for the B.G. Mr. J. J. Simpson, Clerk, St. Peter's Hospital, Bristol.

MARCH 10.—**Hackney.**—BUILDING MATERIALS.—For supply of building and other materials for 6 months at various institutions, for the B.G. Mr. F. R. Coles, Clerk, Hackney Union, 2, Sidney-road, Homerton.

MARCH 10.—**Horsham.**—MATERIALS.—Supply of road materials, to the R.D.C. Mr. W. R. Guilford, surveyor, 42, Albion-terrace, Horsham.

MARCH 11.—**Bingham.**—ROAD MATERIALS.—Supply of road materials to the R.D.C. Mr. J. W. Mason, Clerk, Bingham.

MARCH 11.—**Bury.**—STORES.—Supply of stores to the Gas Department, of the T.C. Mr. H. Simmonds, General Manager, Gas Works, Elton, Bury.

MARCH 11.—**Clowne.**—ROAD MATERIALS.—For supply of road materials for 6 months, for the R.D.C. Mr. J. T. Pears, Surveyor, Hollin Hill, Clowne, Chesterfield.

MARCH 11.—**Midlothian.**—TAR.—For supply of coal tar, tar pitch, &c., for one year, for C.C. Road Office, County Buildings, Edinburgh.

MARCH 11.—**Spenborough.**—MATERIALS.—Supply of road and other materials, to the U.D.C. Mr. Arthur Rothera, Surveyor, Town Hall, Cleckheaton.

MARCH 11.—**Stafford.**—MATERIALS.—Road materials, cartage, and tools for the Staffordshire C.C. Mr. James Moncur, County Surveyor, County Buildings, Stafford.

MARCH 13.—**Doncaster.**—MATERIALS.—Supply of dross, granite and tar to the R.D.C. Mr. W. R. Crabtree, Highway Surveyor, Nether Hall, Doncaster.

MARCH 13.—**Lanark.**—TAR MACADAM.—Supply of tar macadam, to the County of Lanark (District of the Middle Ward). Road Surveyor, Hamilton.

MARCH 13.—**Leek.**—MATERIALS.—Supply of road materials, &c., to the U.D.C. Mr. W. E. Beacham, Surveyor, Town Hall, Leek.

MARCH 13.—**Uckfield.**—MATERIALS.—Supply of road materials to the R.D.C. Capt. E. W. Ray-Johnson, Surveyor, Buxted, Sussex.

MARCH 14.—**Rye.**—MATERIALS.—Supply of highway materials to the R.D.C. Mr. H. J. Elliott, District Surveyor, Winchelsea, Sussex.

MARCH 15.—**Blackwell.**—ROAD MATERIALS.—For supply of road materials for one year, for the R.D.C. Mr. H. Silcock, Surveyor, 67, Westgate, Mansfield.

MARCH 15.—**Hampstead.**—MATERIALS.—Suppl of electrical engineer's stores to the B.C. Mr. A. P. Johnson, Town Clerk, Town Hall, Haverstock-hill, N.W.

MARCH 18.—**East Retford.**—MATERIALS.—Supply to the R.D.C. of broken slag, granite, slag screenings and tar. Mr. John Turrill, Surveyor, 31, Market-place, Retford.

MARCH 18.—**Egypt.**—STORES.—Supply of stores to the Ministry of Interior, Egypt. Department of Overseas Trade, 35, Old Queen-street, S.W.

MARCH 18.—**Hunslet.**—ROAD MATERIALS.—For supply of road materials for one year, for R.D.C. Mr. W. B. Pindar, Clerk, Leek-street, Hunslet, Leeds.

MARCH 18.—**Kiveton Park.**—MATERIALS.—Supply to the R.D.C. of broken slag, granite and tar macadam. Mr. F. Hewitt, Surveyor, Council Offices, Kiveton Park, near Sheffield.

MARCH 23.—**West Ham.**—BUILDING MATERIALS.—For supply of building and other materials for 3 months, for the B.G. Mr. T. Smith, Clerk, Union-road, E. 11.

ENGINEERING, IRON AND STEEL.

MARCH 6.—**London.**—GIRDER BRIDGES.—Supply to the Bengal-Nagpur Railway Company of both or either of the following:—(1) 5 deck span girder bridges, 100 ft. span complete; 4 deck span girder bridges, 100 ft. span complete. (2) 5 deck span girder bridges, 60 ft. span complete; 2 deck span girder bridges, 40 ft. span complete. Offices, 132, Gresham House, Old Broad-street, London, E.C.2. Charge £1 1s.

MARCH 6.—**London.**—MATERIALS.—Supply to the Bengal & North-Western Railway Co., of (*a*) 23¼ tons copper ingots, &c.; (*b*) 30 tons strand wire for fencing; (*c*) 40 tons red lead and 8 tons white lead; (*d*) 236 pairs wheels and axles. Mr. E. A. Neville, 237, Gresham House, Old Broad-street, E.C.2. Charge 10s. each.

MARCH 6.—**Morecambe.**—SCREENING PLANT.—For supply and erection of screening, elevating and raking apparatus at Sewage Disposal Works, for T.C. Mr. Percival Holt, Borough Surveyor, Morecambe.

MARCH 6.—**South Africa.**—SHED.—Supply of whole of materials required for steel-framed building for new engine shed at Vryhard East, Natal. High Commissioner for Union of South Africa, Trafalgar-square, W.C.

MARCH 7.—**Bideford.**—GAS ENGINES.—For supply and erection of two suction gas engines driving two plunger pumps, for the U.D.C. Messrs. St. George-Moore and La Trobe-Bateman, 91, Victoria-street, London, S.W.1. Deposit £1.

MARCH 7.—**London.**—MATERIALS.—Supply of wheels, axles, and deck spans. Director-General, India Store Dept., Belvedere-road, Lambeth, S.E.

MARCH 7.—**London.**—RAILWAY MATERIALS.—Supply of (*a*) bolts, nuts and rivets; (*b*) galvanised work; (*c*) 338¼ tons steel material, to the Burma Railways Co. Mr. F. C. Franks, Secretary, 199, Gresham House, Old Broad-street, E.C.2. Charge 10s. for (*a*) and (*b*), and £1 for (*c*).

MARCH 8.—**Australia.**—TRANSFORMERS.—Supply of 35 cabin transformers for power signalling to the Victorian Railway Commissioners. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

MARCH 8.—**Watford.**—PIPES.—Supply of about 1,700 tons of 18 in. cast-iron pipes and specials to the U.D.C. Mr. D. Waterhouse, Engineer, Council Offices, High-street, Watford. Deposit, £5.

MARCH 10.—**Birmingham.**—HOT-WATER INSTALLATION.—Installation of new hot-water services at the Dudley-road Hospital, for the Board of Guardians. Mr. James Curtis, Clerk, Union Offices, Edmund-street, Birmingham.

MARCH 11.—**Hindley.**—SEWAGE TANKS.—Construction of reinforced concrete humus tanks, for the U.D.C. Mr. O. P. Abbott, Surveyor, Council Offices, Hindley. Deposit, £2 2s.

MARCH 11.—**Whitby.**—RESERVOIR.—Construction of covered service reservoir on Hennibique system of 500,000 gallons capacity, for the Whitby Waterworks Co. Messrs. Fairbank & Son, Engineers, Lendal Chambers, York. Deposit £2 2s.

MARCH 13.—**Belgium.**—CRANES.—Supply of four electric and two floating steam cranes to the Ghent T.C. Dept. of Overseas Trade, 25, Old Queen-street, S.W.

MARCH 13.—**Egypt.**—ANGLES, &C.—Supply of mild steel angles, tees, bolts, rivets, locks, &c., to the Egyptian War Department. Inspecting Engineer, Egyptian and Sudan Government, Queen Anne's Chambers, S.W.

MARCH 14.—**Croydon.**—PULVERISING PLANT.—Supply to the B.C. of pulverising plant for house refuse. Borough Engineer, Croydon. Deposit, £1 1s.

MARCH 14.—**Edinburgh.**—RAILS.—Supply of 130 tons of steel tramway rails. Tramways Manager, 2, St. James-square, Edinburgh.

MARCH 14.—**Manchester.**—VALVES.—For supply of 40 in. manual sluice valves and automatic stop valves, and 54 in. reflux valves, with air valves, gangways, and other ironworks, at Thirlmere Aqueduct, Fourth Pipe Line, for T.C. Secretary, Waterworks Offices, Town Hall, Manchester. Deposit £5 5s.

MARCH 15.—**Australia.**—TELEPHONE OPERATOR.—Supply of telephone protective apparatus to the Deputy Postmaster-General, Brisbane. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

MARCH 16.—**Calcutta.**—WATERWORKS.—(I to VI) Supply and laying in a prepared trench of 30 miles of riveted steel pipe in the following sizes: 60 in., 54 in., 51 in., 48 in., 42 in., 36 in., and 33 in. Messrs. St. George-Moore & La Trobe-Bateman, 91, Victoria-street, Westminster, S.W.1. Deposit £5.

MARCH 16.—**Manchester.**—STEELWORK.—For supply and erection of steelwork in bridges carrying town-planning road, No. 12, over the Great Central and Midland Rlys., for the T.C. City Engineer, Town Hall, Manchester. Deposit £2 2s.

MARCH 17.—**Bristol.**—CRANES.—Construction of four 30-cwt. movable electric jib cranes and the erection of the same in front of shed "A" Avonmouth Docks. Mr. Thomas A. Peace, Engineer's Office, Avonmouth Docks. Deposit £3.

✱MARCH 17.—**Newport, Mon.**—HEATING ENGINEERING.—To submit schemes for heating and hot-water supply to the new Out-Patients' Dept., for new boilers and for such alterations as may be required to the existing heating installation, together with tenders for the work, for the Directors of the Royal Gwent Hospital. Messrs. Griggs & Vaughan, Architects, Metropolitan Bank Chambers, Newport, Mon.

MARCH 20.—**Calcutta.**—TAR-SPRAYING MACHINE.—Supply to the Municipal Council of tar-spraying machine of 600 gall. capacity to be drawn by steam roller. Deputy Chairman, 5, Corporation-street, Calcutta.

MARCH 20.—**Edinburgh.**—ELECTRICAL PLANT.—For auxiliary plant and pipework for specification No. 14 at Portobello Station, for T.C. Sir Alexander B. W. Kennedy, 17, Victoria-street, Westminster, S.W.1. Deposit £2 2s.

MARCH 20.—**Leicester.**—BOILERS, &C.—(1) Lancashire boilers; (2) mechanical stokers and coal conveying plant; (3) setting of the boilers, for sewage station, for the T.C. Mr. E. George Mawbey, City Engineer, Town Hall, Leicester. Deposit £2.

MARCH 20.—**Margate.**—MACADAM-MAKING PLANT.—Supply of steam-driven tar macadam-making plant to the T.C. Mr. E. A. Borg, Borough Engineer, 13, Grosvenor-place, Margate.

MARCH 22.—**Scunthorpe.**—WATERWORKS.—For: (1) Buildings, for extension of pump house, new motor house, fencing, &c.; (2) Construction of covered reinforced concrete reservoir, 1,000,000 gallons capacity, with all inlets, outlets and connecting pipes; (3) Supply and delivery of approximately 1,500 tons of 4 in., 6 in., 8 in., 9 in., 12 in. and 15 in. cast iron mains, &c.; (4) hauling and laying out of mains and castings; (5) laying 9 miles of mains, for the U.D.C. Mr. A. M. Cobban, Engineer, Council Offices, Scunthorpe. Deposit £2 2s.

MARCH 23.—**West Wickham.**—BOILER, &C.—Supply and fixing of a Lancashire boiler, superheater, piping and feed pumps, at West Wickham, Kent, for the Metropolitan Water Board. Chief Engineer's Department, 173, Rosebery-avenue, E.C.1. Deposit, £1 1s.

MARCH 29.—**Australia.**—BORING MACHINE.—Supply of one double spindle boring machine, including tools, gears, and accessories, for Newport workshops, for the Victoria Railway Commissioners. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

APRIL 10.—**Siam.**—RAILWAY ACCESSORIES.—Supply of accessories for goods rolling stock, to the Siam State Railways. Messrs. C. P. Sandberg, 40, Grosvenor-gardens, London, S.W.1. Charge £2.

MAY 7.—**Rochdale.**—SULPHATE OF AMMONIA PLANT.—Supply and erection of sulphate of ammonia plant, for the Gas Committee. Chairman, Gas Committee, Gas Works, Rochdale.

JUNE 19.—**Argentina.**—BRIDGES.—Supply and erection of suspension bridges for local authorities. Dept. of Overseas Trade, 35, Old Queen-street, S.W.

OCTOBER 31.—**New South Wales.**—BRIDGE.—Construction of the superstructure and substructure of a cantilever bridge across Sydney Harbour from Dawes Point to Milson's Point, for the Government of New South Wales. Agent-General for New South Wales, Australia House, Strand, London, W.C.2.

ROAD, SANITARY, AND WATER WORKS.

MARCH 4.—**Hambledon.**—SANITARY.—For removal of refuse, &c., in the parish of Chiddingford, for one year, for the R.D.C. Mr. H. A. Merriman, Clerk, 138, High-street, Guildford.

MARCH 4.—**Hambledon.**—SANITARY.—For removal of refuse, &c., in the parish of Cranleigh, for one year, for the R.D.C. Mr. H. A. Merriman, 138, High-street, Guildford.

MARCH 4.—**Rotherham.**—SANITARY.—For conversion of 27 privies into water-closets at Treeton, for the R.D.C. Mr. C. O. Rawstron, Engineer, Imperial Buildings, Rotherham. Deposit £1 1s.

MARCH 6.—**Mid-Glamorgan.**—WATER MAINS.—Providing and laying (1) about 320 lineal yards of 4 in., and 800 lineal yards of 3 in. diameter cast-iron mains, &c., at Sarn, Aberkenfig; (2) about 200 lineal yards of 6 in. and 650 lineal yards of 3 in. cast-iron mains, &c., at Kenfig Hill, for the Mid-Glamorgan Water Board. Mr. Eiryn W. Davies, Manager, Water Board Offices, Bridgend.

MARCH 6.—**Nunhead.**—ROADWORK.—For kerbing, channelling, tarpaving footways, and tar macadam roadwork, &c., in Lanbury-road, for the Borough of Camberwell. Mr. Frederick J. Slater, Borough Engineer, Town Hall, Camberwell, S.E.5.

MARCH 7.—**London.**—CARRIAGEWAYS AND FOOTWAYS.—Execution of such works as may be required to be done during the term of one, two or three years from the first day of July next, in the repair and maintenance of all works of stone paving in the carriageways and footways of the City, for the Corporation of London City Engineer, Guildhall, E.C.2. Deposit £2 2s.

MARCH 7.—**London.**—REFUSE REMOVAL.—Removal of furnace refuse, &c., from the various works of the Metropolitan Water Board. Chief Engineer, Metropolitan Water Board, 173, Rosebery-avenue, E.C.

MARCH 7.—**London.**—SEWERS AND DRAINS.—Reparation, maintenance and reconstruction of the sewers and drains of the City, for the Corporation of London. Public Health Department, City Engineer, Guildhall, E.C.2. Deposit £2 2s.

MARCH 7.—**Newton Abbot.**—WATER MAINS.—For supply and laying two miles of 3 in. cast-iron water mains, for Islington Water Supply, for R.D.C. Mr. F. Horner, Clerk, Council Offices, 64, East-street, Newton Abbot. Deposit £2 2s.

MARCH 7.—**Rochford.**—SANITARY.—For removal of house refuse in various parishes, for the R.D.C.; also the cleansing and maintenance of the sewage tanks at South Benfleet. Mr. W. Harding Roberts, Clerk, 40, Clarence-street, Southend-on-Sea.

MARCH 7.—**Spenborough.**—STREETS.—Making up of new street, Rawfolds, Liversedge, for the U.D.C. Mr. A. Rothera, Surveyor, Town Hall, Cleckheaton. Deposit £1.

MARCH 8.—**Greasborough.**—SANITARY.—For removal of nightsoil, ashes, refuse, &c., for one year, for U.D.C. Mr. J. H. Jackson, Clerk, Council Offices, Greasborough.

MARCH 8.—**Hereford.**—ROADS.—Hauling, spreading, and rolling work on the County main roads. Mr. G. H. Jack, County Surveyor, Hereford.

MARCH 8.—**Liverpool.**—ROADS.—For drainage and road work at the Walton Institution, for the West Derby B.G. Mr. Ernest B. Bailey, architect, 37, Moorfields, Liverpool. Deposit, £1 1s.

MARCH 8.—**Watford.**—WATER MAINS.—Laying two miles of double 18-in. pipe lines, &c., for the U.D.C. Mr. D. Waterhouse, Council Offices, High-street, Watford. Deposit, £10.

MARCH 10.—**Dorchester.**—ROADS.—Repair of the district roads, for one year, for the R.D.C. Mr. J. J. Estridge, Highway Surveyor, Bleak House, Monmouth-road, Dorchester.

MARCH 11.—**Yorkshire.**—ROADS.—Reconstruction of the main road from Queen-street, South Bank, to Normanby High-street, for the North Riding of Yorkshire C.C. County Surveyor, County Hall, Northallerton.

MARCH 13.—**Barnes.**—ROADS.—Making-up Gilpin-avenue, for the U.D.C. Mr. G. Bruce Tomes, Surveyor, Council House, High-street, Mortlake, S.W.

MARCH 13.—**Crewe.**—SEWER.—Construction of northern outfall sewer, for the T.C. Mr. L. St. G. Wilkinson, Borough Engineer, Municipal Buildings, Crewe. Deposit, £4 4s.

MARCH 13.—**Egypt.**—DRAINAGE WORKS.—The Department of Overseas Trade has received copies of the specifications and drawings connected with Contracts Nos. 7 and 8 for the Mansura Main Drainage scheme, tenders for which are to be presented at the Chief Engineer's Office, Main Drainage Department, Ministry of Public Works, Cairo, by March 13 and April 26, respectively. The documents may be examined at Room 50A, of the Department of Overseas Trade, 35, Old Queen-street, S.W.1.

MARCH 13.—**Skegness.**—ROADS.—(1) Repaving Lumley-road; (2) brick and tile cartshed, for the U.D.C. Mr. R. H. Jenkins, Surveyor, Council Offices, Skegness.

MARCH 14.—**Havant.**—SEWERAGE WORKS.—For main sewerage and sewage disposal works extension, for the U.D.C. Major T. J. Moss-Flower, Engineer, 28, Victoria-street, Westminster. Deposit, £10.

MARCH 14.—**Salford.**—ROADS.—For tar macadam work and the paving, flagging and completing of streets, for the T.C. Borough Engineer, Town Hall, Salford.

MARCH 18.—**Stafford.**—ROADS.—Making up Alliance-street, Izaak Walton-street, and a portion of Co-Operative-street, for the T.C. Mr. W. Plant, Borough Engineer, Stafford. Deposit £1 1s.

Competitions.

(*See Competition News, page* 332.)

Auction Sales, Tenders, etc.

✱MARCH 8.—**Brixton Hill, S.W.**—Messrs. Veryard & Yates will sell without reserve at 4, Mill-lane, Brixton-hill, S.W., useful timber and building material. Auctioneers, 365, Norwood-road, S.E.27.

Public Appointments.

MARCH 6.—**Pontefract.**—Clerk of Works required by the Pontefract R.D.C. in connection with a Housing Scheme for 500 houses. Geo. W. Holman, Clerk, 29, Ropergate, Pontefract.

✱MARCH 8.—**Rotherham.**—Architects' and Surveyors' Assistant (Temporary) required in the Architects' Department, by the County Boro' Council. Mr. Chas. L. des Forges, Town Clerk, Town Hall, Rotherham.

✱MARCH 14.—**Bedford.**—Qualified Assistant required in the Borough Engineer's Office capable of preparing plans, specifications, quantities and estimates, for a number of new cottages, by the Borough Council. Mr. N. Greenshields, Boro' Engineer and Surveyor, Town Hall, Bedford endorsed "Temporary Assistant."

The Great West Road.

The first section of the Great West Road is now nearing completion, and is a fine example of a carriageway, being 50 ft. wide between kerbs, and 5,600 ft. long. The concrete foundation is reinforced with B.R.C. fabric, and the surface is to be 2 in. of compressed asphalte. This section is being carried out by the Middlesex County Council, under the supervision of Mr. A. Dryland, M.Inst.C.E., the County Surveyor.

THE BRITISH INDUSTRIES FAIR.

THE British Industries Fair (Birmingham) was officially opened at Castle Bromwich last week, by the Lord Mayor of Birmingham (Alderman David Davis), the ceremony being followed by a luncheon at which a large number of manufacturers in the district were present. In the course of some speeches at the luncheon, Mr. H. O. Worrall (Chairman of the Council) pointed out that the primary purpose of the Fair was to help the exhibitors. It was not a profit-making concern, and any surplus which was available was used for the future development and extension of the Fair. He referred to the success which the Fair had achieved in the short period during which it had been held and predicted a great future for the exhibition. They had done very well considering the bad times through which they had passed; he believed, however, that trade had passed through its worst period, and that there were signs in every direction of improved trade conditions. They had ample room for the extension of the fair at Castle Bromwich, and he believed that course would become necessary in the course of a few years.—Mr. Percy Plant (Honorary Treasurer of the Fair) also emphasised the fact that the fair catered for the trading community, and for that reason the general public were not admitted.

The Fair occupies a floor space of over 100,000 sq. ft., which is occupied by representative exhibits of the metal working industries of the country and other articles of commerce.

The exhibits in Group Three, classified under the heading of "Construction, Building, and Decoration," comprise building materials; builders' ironmongery and hardware; architectural and ornamental work; constructional steelwork, ferro-concrete; sanitary apparatus, appliances and fittings; contractors' plant; shop, bar and restaurant fittings; municipal engineering and equipment; paints, colours, enamels, varnishes, stains, polishes, lacquers, metal powders, glues and adhesives; mechanical and hand painting and spraying apparatus; decorating materials, wall papers and coverings.

Group 4 (Power, Lighting, Heating, Cooking, and Ventilating) comprises electrical, gas, oil, steam, and other plant, apparatus, appliances, equipment and fuels, and ventilating plant.

Group 5 (Engineering) comprises general machinery, machine tools, engineering and industrial tools; sheet metal machinery; transmission, conveying, lifting and hauling appliances; sawmill equipment; industrial rubber goods and engine packings; foundry appliances and requisites; malleable iron-foundry, drop forgings, die castings; general castings; wire, tube and rolling mill plant; hydraulic plant; scales, balances, and other weighing instruments; measuring and testing instruments and appliances; heat treatment of metals; industrial equipment; railway materials; carriage work; ropes and cables of steel and hemp.

The Birmingham Chamber of Commerce and the Council of the Fair offer a cordial invitation to all buyers in His Majesty's Dominions and foreign countries to visit the Fair.

The British Industries Fair at the White City was opened on Monday last, and will remain open until March 10.

Incorporated Company of Bricklayers, Wallers and Plasterers.

At a meeting of the Incorporated Company of Bricklayers, Wallers, and Plasterers, held in Newcastle last week, Councillor James Lunn, builder and contractor, was congratulated upon his election to the office of Sheriff of Newcastle. For the past forty years Mr. Lunn has been a member of the Company, and for the past twenty-eight years has officiated as a steward. After the accounts of the Company had been submitted and adopted, the Sheriff and Mr. Alfred M. Davidson (who has acted in the capacity for sixteen years) were both re-elected Stewards.

THE SUPPLY OF LIGHT CASTINGS.

THE Board of Trade Committee, under the chairmanship of Sir W. Ackworth, has decided that the application of the National Light Castings Association for protection under the Safeguarding of Industries Act against German competition had not been made out.

A newspaper report of the proceedings is as follows, but we regret that the case for the Association is not reported more fully.

Sir W. Ackworth, examining Mr. King, Chairman of the Association, said it was suggested that the Association not merely represented the trade but penalised people who did not deal with it, assigned output among the members, and fixed prices on an average basis which tended to keep alive uneconomical firms at the cost of the public.

Mr. King said the Government advised employers to form themselves into associations. They had been of service to the Government in regard to the housing scheme and other matters, and the Government had thanked them.

The Chairman: Has the Government ever blessed this type of association? Is it a fact that you regulate prices to every member, that you apportion output to some extent, and you give a preferential rebate to people who consent to deal with you only?—Yes, we are an employers' trade union. I do not know that the Government has actually specified these things.

Mr. King and Mr. Wallace were questioned respecting some tables of rates of wages of moulders, and the number of assistants usually working with each moulder.

The Chairman said there were serious differences in what was stated by witnesses, and the committee considered the tables unreliable. They did not propose to call on the opposition to reply. There were some absent members, however, who might conceivably hold a different view, and applicants were entitled to say if they wished to fight the case out.

Sir Harold Smith, for the applicants, said that in view of the Chairman's statement they were of opinion no useful purpose would be served by continuing the hearing.

Builders' Estates.

Mr. Isaac George, of Mountain Ash, retired builder, who died on September 30 last, left estate of the gross value of £49,282.

The late Mr. Eric Maurice May, O.B.E., of Harperbury, Radley, Herts, a director of Cubitt's Engineering Co., Ltd., a director and secretary of Messrs. Holland and Hannen and Cubitts, Ltd., left estate valued at £30,426.

The late Mr. Thomas Hall, of Messrs. Hall, Beddall & Co., builders, Pitfield Wharf, Waterloo Bridge, S.E., who died on December 26 last, aged 87, left estate of the gross value of £64,030, with net personalty £60,980. The testator left £100 to W. Scott, if still in the employ of Messrs. Hall, Beddall & Co., and £2,000 to his son, Herbert Nicholls Hall, but directed that if his trustees should be unable to trace the whereabouts of his son within two years the legacy is to lapse, and it is to be assumed that he predeceased the testator.

Staff Dinner.

Mr. W. H. Grigg, builder and decorator, of Dover, last week entertained his staff and employees to dinner on the occasion of the twenty-eighth year of the existence of the business. In the course of a short speech, Mr. Grigg said, before the war a house could be erected for £300, which meant that one hundred houses would cost £30,000. This sum now would only cover the cost of erecting 30 cottages. By employing 10 men per house, the £30,000 job in former days provided employment for one thousand persons, whereas to-day the same amount of money only engaged three hundred men, thus leaving seven hundred men on the Labour Exchange. The fallacy of too short hours was suicidal, and the proper and only remedy for unemployment was quantity.

PRICES CURRENT OF MATERIALS.*

[Owing to the exceptional circumstances which prevail at the present time, prices of materials should be confirmed by inquiry. Since our last issue several prices have been revised.—Ed.]

BRICKS, &c.

Per 1,000 Alongside, in River Thames up to London Bridge.	£ s. d.
Best Stocks	4 13 0
Per 1000, Delivered at London Goods Stations.	
Flettons, at	£ s. d.
King's Cross	3 5 0
Do. grooved for plaster	3 7 0
Do. Bullnose	4 0 0
Best Stourbridge Fire bricks:—	
2½ in.	11 3 0
GLAZED BRICKS—	
Best White, Ivory, and Salt Glazed Stretchers	26 0 0
Headers	25 10 0
Quoins, Bullnose and 4½in. Flats	32 10 0
Best Blue Pressed Staffs.	10 11 6
Do. Bullnose	11 1 6
Blue Wire Cuts	8 11 6
3 in.	13 2 0
D'ble Str'tch'rs	34 10 0
D'ble Headers	31 10 0
One Side and two Ends	35 10 0
Two Sides and one End	36 10 0
Splays and Squints	34 0 0

Second Quality, £1 per 1,000 less than best. Cream and buff, £2 extra over white. Other colours, Hard Glaze, £5 10s. extra over white.

	s. d.	
Thames Ballast	14 0	per yard, delivered 2 miles radius Paddington.
Pit Sand	17 0	" "
Thames Sand	19 0	" "
Best Washed Sand	19 0	" "
¾in. Shingle for Ferro-Concrete	19 0	" "
¼ in. " "	20 0	" "

Per ton delivered in London area in full van loads.

	£ s. d.	£ s. d.
Best Portland Cement. British Standard Specification Test	3 10 6	3 16 0
63/6 alongside at Vauxhall in 80-ton lots.		
Ferrocrete per ton extra on above		10 0

NOTE.—The sacks are charged at 1s. 9d. each and credited at 1s. 6d. each if returned in good condition within three months, carriage paid.

Best Ground Blue Lias Lime 2 8 0 at rly. depot.
Grey Stone Lime 61s. 0d. per ton delivered in City and Central districts.
Stourbridge Fireclay in s'cks 37s. 8d. per ton at rly. dpt.

STONE.

	s. d.
BATH STONE—delivered in railway trucks at Westbourne Park, Paddington, G.W.R., or South Lambeth, G.W.R., per ft. cube	3 2½
Do. do. delivered in railway trucks at Nine Elms, L. & S.W.R., per ft. cube	3 5½
Do. do. delivered on road wagons at Nine Elms Depot	3 6½
PORTLAND STONE—	
Brown Whitbed, in random blocks of 20 ft. average, delivered in railway trucks at Nine Elms, L. & S.W.R., South Lambeth Station, G.W.R., and Westbourne Park, Paddington, G.W.R., per ft. cube	4 11½
Do. do. delivered on road wagons at above stations, per ft. cube	5 0½
White basebed, 3d. per ft. cube extra.	
NOTE.—½d. ft. cube extra for every foot over 20 ft. average, and ½d. beyond 30 ft.	
YORK STONE, BLUE—*Robin Hood Quality.* Delivered at any Goods Station London.	s. d.
6 in. sawn two sides landings to sizes (under 30 ft. super.) Per Ft. Super	7 4½
6 in. rubbed two sides, ditto "	8 0½
3 in. sawn two sides slabs (random sizes) "	3 3
2 in. to 2½ in. sawn one side slabs (random sizes) "	2 1
1½ in. to 2 in. ditto, ditto "	1 9
HARD YORK— Delivered at any Goods Station London.	
Scappled random blocks Per Ft. Cube	8 0½
6 in. sawn two sides landing to sizes (under 40ft. super.) Per Ft. Super	7 0
6 in. sawn two sides ditto "	8 0
4 in. sawn two sides slabs (random sizes) "	3 11
3 in. ditto, ditto "	3 1
2 in. self-faced random flags Per Yard Super	10 6

WOOD.

GOOD BUILDING DEAL.

Inches	£ s.	
4 × 11	36 0	per standard
4 × 9	35 0	"
4 × 8	30 0	"
4 × 7	30 0	"
3 × 8	30 0	"
3 × 7	25 0	"
2½ × 7	25 0	"
3 × 6	25 0	"
3 × 11	34 0	"
2 × 11	32 0	"
3 × 9	30 0	"
2½ × 9	30 0	"
3 × 4½	20 10	"
3 × 4	20 10	"

PLANED BOARDS.

1 × 11	42 10	"
1 × 9	37 10	"

PLAIN EDGE FLOORING.

Inches		
¾	20/-	per square
¾	22/6	"
1	25/-	"
1¼	32/6	"
1½	44/-	"

TONGUED AND GROOVED FLOORING.

Inches		
1	25/-	per square
1¼	32/6	"
1½	44/-	"

WOOD (*Continued*).

MATCHINGS (BEST).

Inches		
¾	17/6	per square
¾	22/6	"
1	25/-	"

Inches BATTENS.	s. d.	
¾ × 2	3 0	per 100 ft.

SAWN LATHS.

Per bundle	0 4 0

Dry Wainscot Oak, per ft. super, as inch	0 2 6	to	0 3 0		
¼ in. do. do.	0 1 10½	to	0 2 6		
Dry Mahogany—Honduras, Tabasco, African, per ft. super, as inch	0 2 3	to	0 3 0		
Cuba Mahogany	0 3 6	to	0 4 0		
Teak (Rangoon, Moulmein or Java), per load	52 10 0	to	55 0 0		
American Whitewood planks, per ft. cube	0 16 0	to	0 18 0		
Best Scotch Glue, per cwt.	0 5 0	to	—		
Liquid Glue, per cwt.	5 3 0	to	6 10 0		

SLATES.

1st quality slates from Bangor or Portmadoc in truck load delivered London area. Per 1,000 of 1,200.

		£ s. d.
Best Blue Bangor Slates,	24 by 12	46 10 0
" "	22 by 12	42 5 0
First quality " "	22 by 11	39 0 0
" "	20 by 12	37 2 6
Best Blue Portmadoc	20 by 10	31 15 0
" "	18 by 10	26 5 0
First quality "	18 by 9	23 2 6
" "	16 by 10	22 0 0
" "	16 by 8	17 2 6

TILES.

	Per 1,000 f.o.r. London. £ s. d.
Best machine-made tiles from Broseley or Staffordshire district	7 0 0
Ditto hand-made ditto	7 15 0
Ornamental ditto	8 0 0
Hip and valley tiles (per dozen)	0 12 0

METALS.

JOISTS, GIRDERS, &c., TO LONDON STATION PER TON—	£ s. d.
R. S. Joists, cut and fitted	14 10 0
Plain Compound Girders	16 10 0
" Stanchions	18 0 0
In Roof Work	22 0 0

WROUGHT IRON TUBES AND FITTINGS—
(Discount off List for lot of not less than £15 net value delivered direct from Works, 5 per cent. less above gross discounts, carriage forward if sent from London Stocks.)

Tubes, (all sizes).	Fittings. Up to 2".	Fittings. Over 2".	Flanges. Up to 2".	Flanges. Over 2"
Gas	47½%	45 %	50 %	60 %	65 %
Water	41½%	40 %	45 %	55 %	60 %
Steam	35 %	35 %	40 %	50 %	55 %
Galv'd—					
Gas	32½%	37½%	42½%	52½%	57½%
Water	25 %	32½%	37½%	47½%	52½%
Steam	17½%	27½%	32½%	42½%	47½%

L.C.C. COATED SOIL PIPES—London Prices ex works.

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
2 in. per yd. in 6fts plain	4 7	3 7	4 4
2½ in. " "	5 6	3 11	5 5
3 in. " "	6 6	4 4	6 6
3½ in. " "	7 2	5 5	7 6
4 in. " "	8 3	6 1	8 7

RAIN-WATER PIPES, &c.

	Pipe. s. d.	Bends, stock angles. s. d.	Branches, stock angles. s. d.
2 in. per yd. in 6fts. plain	2 11	2 3½	3 1½
2½ in. " "	3 3	2 8½	3 9
3 in. " "	3 10½	3 4	5 0
3½ in. " "	4 6½	3 11½	5 10
4 in. " "	5 2	4 9½	7 0

L.C.C. DRAIN PIPES.—9 ft. lengths. London Prices per yd.: 4 in., 6/3. .. 5 in., 7/10. .. 6 in., 9/6.

METALS (*Continued*).

	Per ton in London. £ s. d.		£ s. d.
Sheets Galvanised Flat, Best quality—			
Best Soft Steel Sheets, 6ft. by 2ft. to 3ft. to 20g. and thicker	27 0 0	..	28 0 0
Best Soft Steel Sheets, 22 g. and 24 g.	28 0 0	..	29 0 0
Best Soft Steel Sheets, 26 g.	30 0 0	..	31 0 0
Cut Nails, 3in. to 6in.	25 0 0	..	26 0 0

(under 3in. usual trade extras.)

METAL WINDOWS—Standard sizes suitable for complete houses, including all fittings, painting two coats, and delivery to job, average price about 3s. per foot super.

LEAD, &c.

	Delivered in London. £ s. d.		
LEAD—Sheet, English, 4 lb. and up	32 0 0	..	—
Pipe in coils	32 10 0	..	—
Soil Pipe	35 0 0	..	—
Compo pipe	36 0 0	..	—

NOTE—Country delivery, 30s. per ton extra; lots under 5 cwt., 1s. 6d. per cwt. extra. Cut to sizes, 2s. cwt. extra.

Old lead, ex London area, at Mills per ton	18 0 0	..	—
Do., ex country, carriage forward per ton	19 0 0	—	—

COPPER—

Strong Sheet per lb.	0	2	3	—
Thin " "	0	2	4	..
Copper nails "	0	2	3	..
Copper wire "	0	2	4	—
TIN—English Ingots "	0	1	9	..
SOLDER—Plumbers' "	0	0	10	..
Tinmen's "	0	1	0	..
Blowpipe "	0	1	3	..

GLASS.

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES AND IN SQUARES IN ORDINARY SIZES.

Per Ft.		Per Ft.
15 oz. fourths	4½d.	32 oz. fourths 9½d.
" thirds	5½d.	" thirds 11d.
21 " fourths	6½d.	Obscured Sheet, 15 oz. 7d.
" thirds	6½d.	21 " 9d.
26 " fourths	7½d.	Fluted and Enamelled 15 " 11d.
" thirds	8½d.	21 " 1/2

Extra price according to size and substance for squares cut from stock.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

	Per Ft.
¼ Rolled plate	4½d.
⅛ Rough rolled	6d.
¼ Rough rolled	6½d.
Figured Rolled, Oxford Rolled, Baltic, Oceanic, Arctic, Stippolyte, and small and large Flemish white	7d.
Ditto, tinted	9½d.
Rolled Sheet	6d.
White Rolled Cathedral	5½d
Tinted do.	7½d.

Cast Plate is same price as rough rolled.

PAINTS, &c.

		£ s. d.
Raw Linseed Oil in pipes per gallon		0 4 0
" " " in barrels "		0 4 1
" " " in drums "		0 4 2
Boiled " " in barrels "		0 4 5
" " in drums "		0 4 7
Turpentine in barrels "		0 6 0
" in drums (10 gall.) "		0 6 3
Genuine Ground English White Lead, per ton (In not less than 5 cwt. casks.)		54 5 0
GENUINE WHITE LEAD PAINT— "Father Thames," "Nine Elms," "Park," "Supremus" and other best brands (in 14 lb. tins) not less than 5 cwt. lots per ton delivered		76 0 0
Red Lead, Dry (packages extra) per ton		38 0 0
Best Linseed Oil Putty per cwt.		0 17 0
Filocol per cwt.		0 15 6
Size. X D Quality		0 4 6

VARNISHES, &c.

	Per gallon. £ s. d.
Oak Varnish Outside	0 15 0
Fine ditto ditto	0 17 2
Fine Copal ditto	1 1 6
Pale Copal ditto	1 2 6
Pale Copal Carriage ditto	1 4 6
Best ditto ditto	1 14 6
Floor Varnish Inside	0 19 0
Fine Pale Paper ditto	0 18 0
Fine Copal Cabinet ditto	1 2 6
Fine Copal flatting ditto	1 0 6
Hard drying Oak ditto	0 18 0
Fine Hard drying Oak ditto	0 19 0
Fine Copal Varnish ditto	1 0 6
Pale ditto ditto	1 2 6
Best ditto ditto	1 14 6
Best Japan Gold Size	0 12 6
Best Black Japan	0 18 0
Oak and Mahogany Stain (water)	0 17 6
Brunswick Black	0 11 0
Berlin Black	0 16 6
Knotting (patent)	1 16 0
French and Brush Polish	1 8 0
Liquid Dryers in Terebine	0 13 6
Cuirass Black Enamel	0 7 0

Per Ton in London.	£ s. d.		£ s. d.
IRON—			
Common Bars	13 10 0	to	14 10 0
Staffordshire Crown Bars good merchant quality	14 10 0	..	15 10 0
Mild Steel Bars	17 10 0	..	18 10 0
Steel Bars. Ferro-Concrete quality, basis price	12 10 0	..	13 10 0
Hoop Iron, basis price	18 0 0	..	19 0 0
" Galvanised	31 0 0	..	33 0 0
Soft Steel Sheets, Black—			
Ordinary sizes to 20 g.	16 0 0	..	17 0 0
" " " 24 g.	17 0 0	..	18 0 0
" " " 26 g.	18 10 0	..	20 10 0
Sheets Flat Best Soft Steel, C.R. & C.A. quality—			
Ordinary sizes, 6ft. by 2ft. to 3ft. to 20 g.	21 0 0	..	22 0 0
Ordinary sizes, 6ft. by 2ft. to 3ft. to 22 g. and 24 g.	22 0 0	..	23 0 0
Ordinary sizes, 6ft. by 2ft. to 3ft. to 26 g.	24 0 0	..	26 0 0
Flat and Galvanised Corrugated Sheets—			
Ordinary sizes, 6 ft. to 9ft. 20 g.	21 10 0	..	22 10 0
Ordinary sizes, 6ft. to 9ft. 22 g. and 24 g.	22 0 0	—	23 0 0
Ordinary sizes, 6ft. to 9ft. 26 g.	24 0 0	..	25 0 0

* The information given on this page has been specially compiled for THE BUILDER and is copyright. Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the highest or lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

CURRENT PRICES FOR BUILDING WORK IN LONDON.*

EXCAVATOR.

		s.	d.
Digging and throwing or wheeling and filling carts, and carting away to shoot—6 ft. deep	per yard cube	15	6
Add if in clay	" "	1	9
Add for every additional depth of 6 ft.	" "	1	3
Planking and strutting to trenches	per foot super	0	7
Do. to sides of excavation, including shoring	" "	1	2

CONCRETOR.

Portland cement concrete in foundation 1 to 6	per yard cube	43	0
Add if in underpinning in short lengths	" "	9	6
Add if in floors 6 in. thick	" "	3	10
Add if in beams	" "	4	9
Add if aggregate 1 : 2: 4	" "	12	0
Add for hoisting not exceeding 10 ft. beyond the first 10 ft.	" "	4	0

BRICKLAYER.

		£	s.	d.
Reduced brickwork in lime mortar and Fletton bricks	per rod	39	15	0
Add if in stocks	"	8	10	0
Add if in Staffordshire blues	"	25	10	0
Add if in Portland cement and sand	"	3	10	0

FACINGS.

Extra for facing in English or Flemish bond for every 10s. per 1,000 over the price of the common bricks	per ft. super	0	0	1¼

POINTING.

Neat flat strucks or weathered joint	" "	0	0	3

ARCHES.

Extra only to the price of ordinary brickwork :—				
Fair external in half brick rings	" "	0	0	11½
Axed in stocks	" "	0	1	11
Rubbed and gauged jointed in putty camber or segmental	" "	0	6	8

SUNDRIES.

Damp course in double course of slates breaking joint and bedded in Portland cement	" "	0	1	5
Setting ordinary register grates and stoves	each	1	1	0
Setting kitchener, including forming flues, &c., with all necessary fire bricks	"	5	5	0

ASPHALTER.

		s.	d.
Half-inch horizontal damp course	per yard sup.	7	6
Three-quarter-inch vertical damp course	" "	11	8
¾ inch on flats in two thicknesses	" "	8	6
Angle fillet	per foot run	0	3
Skirting and fillet 6 in. high	" "	1	4

MASON.

York stone templates fixed	per foot cube	16	3
York stone sills fixed	" "	28	6
Bath stone and all labour fixed	" "	15	0
Portland stone fixed	" "	23	0

SLATER.

Welsh 16 in. × 8 in. 3 in. lap, including nails	per square	98	0
Do. 20 in. × 10 in. Do. Do.	"	115	0
Do. 24 in. × 12 in. Do. Do.	"	117	6

CARPENTER AND JOINER.

Fir framed in plates	per foot cube	6	9
Do. joists	" "	7	9
Do. roofs, floors and partitions	" "	7	9
Do. trusses	" "	10	0

		¾"	1"	1¼"	2"
Deal rough close boarding	per sq.	42/–	48/–	56/–	85/–

		s.	d.
Flat centering for concrete floor, including struts or hangers	"	63	0
Do. to beams	per ft. sup.	1	6
Centres for arches	"	2	0
Gutter boards and bearers	"	1	6

FLOORING.

		¾"	1"	1¼"	1½"
Deal edges shot	per sq.		49/–	58/–	67/–
Do. tongued and grooved	"		54/–	65/–	72/–
Do. matchings	"	45/–	55/–		
Moulded skirting, including backings and grounds	per ft. sup.	1/8	2/1	2/3	2/9

SASHES AND FRAMES.

		s.	d.
One-and-a-half moulded sashes or casements	per foot super	1	11
Two Do. Do. Do.	" "	2	4½
Add for fitting and fixing	"	0	6
Deal-cased frames with 1 in inner and outer linings, 1½ in. pulley stiles tongued to linings, hard wood sills with 2 in. moulded sashes in squares double hung, double hung with pulleys. lines and weights ; average size	" "	4	9

DOORS.

		1½"	1¾"	2"
Two-panel square framed	per ft. sup.	2/6	2/9	2/11
Four-panel Do.	"	2/10	3/2	3/5
Two-panel moulded both sides	"	3/2	3/5	3/8
Four-panel Do. Do.	"	3/6	3/9	4/–

CARPENTER AND JOINER—continued.

FRAMES.

		s.	d.
Deal wrot moulded and rebated	per foot cube	15	6

		1"	1¼"	1½"
Plain deal jamb linings framed	per ft. sup.	1/11	2/–	2/3
Deal shelves and bearers	"	1/8	1/10	2/1
Add if cross tongued	"	2d.	2d.	2d.

STAIRCASES.

		1"	1¼"	1½"	2"	2½"
Deal treads and risers in and including rough brackets		2/3	2/6	2/11	—	—
Deal strings wrot on both sides and framed		1/9	2/1	2/3	2/9	—

		s.	d.
Housings for steps and risers	each	0	11½
Deal balusters, 1 in. × 1¼ in.	per ft. run.	0	9
Mahogany handrail ; average 3 in. × 3 in.	" "	6	0
Add if ramped	" "	11	10
Add if wreathed	" "	23	9

FIXING ONLY IRONMONGERY (INCLUDING SCREWS).

6 in. barrel bolts	8½d.	Rim locks	2/4½
Sash fasteners	11½d.	Mortice locks	5/3
Casement fasteners	1/5	Patent spring hinges and letting in to floor and making good	19/–
Casement stays	1/2		
Cupboard locks	1/5		

FOUNDER AND SMITH.

		s.	d.
Rolled steel joists	per cwt.	20	0
Plain compound girders	"	23	0
Do. stanchions	"	26	0
In roof work	"	31	0

RAIN-WATER GOODS.

		3"	4"	5"	6"
Half-round plain rebated joints	ft. run	1/11	2/4½	3/7	4/–
Ogee Do. Do.	"	2/4½	3/1	3/10	4/9
Rain-water pipes with ears	"	2/9	3/7		
Extra for shoes and bends	each	4/4	5/11		
Do. stopped ends	"	1/11	2/4½	3/7	4/–
Do. nozzles for inlets	"	2/2	2/7	3/10	4/3

PLUMBER.

		s.	d.
Milled lead and laying in flashings and gutters	per cwt.	56	0
Do. Do. in flats	"	52	0
Extra labour and solder in coated cesspools	each	7	4
Welt joint	per ft. run.	0	6
Soldered seam	" "	1	10
Copper nailing	" "	0	7

		½"	¾"	1"	1½"	2"	4"
Drawn lead waste	per ft. run	10d.	1/6	1/9	3/1	3/10	
Do. service	"	1/5	1/11	2/3	3/6		
Do. soil	"						6/2
Bends in lead pipe	each					3/3	8/2
Soldered stop ends	"	1/2	1/8	2/1	2/10	3/6	
Red lead joints	"	11d.	1/–	1/3	1/11	2/4	4/10
Wiped soldered joints	"	2/10	3/6	4/–	4/11	6/6	9/9
Lead traps and cleaning screws	"				14/7	19/6	
Bib cocks and joints	"	6/4	9/7	15/4	41/–		
Stop cocks and joints	"	15/4	17/2	25/8	64/–		

PLASTERER.

		s.	d.
Render, float and set in lime and hair	per yard sup.	3	2
Do. Do. Sirapite	" "	3	7
Do. Do. Keen's	" "	4	9
Add sawn lathing	" "	1	9
Add metal lathing	" "	3	0
Portland cement screed	" "	2	9
Do. plain face	" "	4	6
Mouldings in plaster	per 1 girth	0	3
One-and-a-half granolithic pavings	per yard sup.	6	7

GLAZIER.

		s.	d.
21 oz. sheet plain	per foot sup.	1	1
26 oz. Do.	" "	1	4
Obscured sheet	" "	1	8
⅛ in. rolled plate	" "	1	0
¼ in. rough rolled or cast plate	" "	1	1
¼ in. wired cast plate	" "	1	7

PAINTER.

		s.	d.
Preparing and distempering, 2 coats	per yard sup.	1	3
Knotting and priming	" "		8
Plain painting 1 coat	" "	1	0
Do. 2 coats	" "	1	9
Do. 3 coats	" "	2	6
Do. 4 coats	" "	3	3
Graining	" "	2	8
Varnishing twice	" "	2	0
Sizing	" "	0	4
Flatting	" "	0	8
Enamel	" "	1	6
Wax polishing	per foot sup	0	10½
French polishing	" "	1	3
Preparing for and hanging paper	per piece	2/– to	4/–

* These prices apply to *new buildings only*. They cover superintendence by foreman and carry a profit of 10% on the prime cost without establishment charges. A percentage of 1½ should be added for Employers' Liability and National Health and Unemployment Acts and from 1s. 6d. per £100 for Fire Insurance. The whole of the information given on this page is copyright.

PROPOSED NEW BUILDINGS & OTHER WORKS.*

IN these lists care is taken to ensure the accuracy of the information given, but it may occasionally happen that, owing to building owners commencing work before plans are finally approved by the local authorities, "proposed" works at the time of publication have been actually commenced. Abbreviations:—T.C. for Town Council; U.D.C. for Urban District Council; R.D.C for Rural District Council; E.C. for Education Committee; B.G. for Board of Guardians; L.C.C. for London County Council; B.C. for Borough Council; and P.C. for Parish Council.

FAMBLE.—Plans passed by U.D.C.:—Sanitary arrangements for mineral water works for Mr. E. Coulson.

ANDOVER.—The County Architect has presented plans for temporary school premises, at an estimated cost of £3,900, and these have been approved by the Southampton C.C.

BIRKENHEAD.—Plans passed by T.C.:—Picture theatre, lock-up shops, dancing hall, and café, 91, 91A and 91B, Oxton-road, and rear of 1 to 21, Carnforth-street; alterations and additions to 112, Grange-road; builder's office and workshop, Euston-grove; picture theatre, Borough-road; sanitary convenience corner of St. Paul's-road and Mersey-road; alterations 151, Grange-road; sanitary convenience, corner of New Chester-road and St. Paul's-road; alterations and additions, 14, Rock Park.

BLACKPOOL.—Plans are being prepared by Mr. T. A. Mawson for the construction of a park, which will be one of the finest in Great Britain. Plans before the Town Improvement Committee provide for thirty-two tennis courts, seventeen playing-fields, for football, cricket, hockey, &c.; half a dozen bowling-greens, an 18-hole golf course, and also an 18-hole putting course. One of the features will be a county cricket ground, with accommodation for 25,000 spectators. Two-thirds of the park will be devoted to recreation. There will be a lake of 26 acres in extent to provide facilities for boating; also a separate model yacht pond for children; botanical gardens, Italian gardens, and two terraces, with pavilions, are also features of this project, which, it is anticipated, will take from seven to ten years to complete. The new park will be to the east of the town, with the main entrance from the Preston-road.

BOLTON.—Plans passed by T.C.:—Mr. Richard Hardman, motor garage, 4, Northland-road; Messrs. Wm. Townson & Sons, saw mill, Higher Swan-lane; Mr. P. J. Wolfenden, bathroom, 61, Ellesmere-road; Mr. James Dutton, shed, 101, Sapling-road; Mr. John J. Marsden, covering to yard, back Sapling-road North; Sir Thomas Flitcroft, sectional garage, "Bedford House," Chorley New-road; Mr. Thomas Jackson, motor cycle shed, back Park-road; Mr. J. Aspinall, wooden motor shed, Eckersley-street; Mr. C. E. Brown, store shed, Hawthorne-road; Mr. J. S. Porritt, warehouse, Great Moor-street; Rev. F. Manning, extension to St. Mary's R.C. Church, Palace-street.

BRAINTREE.—The U.D.C. proposes to borrow £2,100 for the purchase of land and laying it out as a cemetery.

BRAZIL.—The Commercial Secretary to H.M. Embassy at Rio de Janeiro states that the sum of £200,000 is to be expended on the proposed port works at Natal, Rio Grande do Norte. Interested British firms should apply to the Department of Overseas Trade, 35, Old Queen street, Westminster, London, S.W.1, for further particulars.

CAMBRIDGE.—Plans passed by T.C.:—Alterations, Sidney-street, for Fullers', Ltd., Hammersmith, W.6.; garage, 173, Cherry Hinton-road, for Mr. C. A. Dallas, 9, Rustat-road; alterations, Burleigh-street, for the Cambridge Co-operative Society, Ltd., Burleigh-street; house, Storey's Way, for Mr. Arthur Negus, Lyndewode-road; additions, 15, Holland-street, for Mr. P. T. Ladds, 15, Holland-street; workshop and storage, Wetenhall-road, for Mr. J. R. Claxton, 55, Ross-street; house, Hills-road, for Mr. Norman T. Myers, Hills-road; house, Storey's Way, for Mr. J. Line, 66, St. Barnabas-road; science and play rooms, Bateman-street, for the Mother Superior, St. Mary's Convent, Bateman-street; open shed, 69, Tenison-road, for Mr. C. R. Alder, 69, Tenison-road; pair of houses, Milton-road, for Mr. H. W. Hyde, Hardwick-street; house, Vinery-road, for Messrs. Twinn Bros., 1, Great Eastern-street.

CROYDON.—Plans passed by T.C.: Messrs. Bethell & Swannell, dairy, 69–71, London-road (rear of); The Research Associat on of British Rubber and Tyre Manufacturers, alterations and additions, 105 and 107, Lansdowne-road; Mr. R. W Trent, bungalow, Monks Orchard Estate; Mr. H. Payne Wyatt, additions, 15, Duppas Hill-road; Mr. A. Stewart, two houses, Preston-road; Mr. A. A. Peskett, 4 bungalows, Aurelia-road; Messrs. Woodward & Co., additions, Morland-road, St. Martin's Church; Mr. B. Crewe, reconstruction of cinema, North End, "Palladium"; Mr. G. P. Banbury, cottage and extensions to factory buildings, Factory-lane; Mr. R. J. Sadleir, additions, Addiscombe-road, "Standon"; Mr. R. Cohen, two garages, Hathaway-road; Messrs. J. Flemming & Co., garage, London-road, Norbury, "Stoke Cottage"; Messrs. Paish, Tyler & Crump, 8 houses, Shirley-road; Messrs. G.E.Everitt &Sons,Ltd., house, 29, Chatsworth-road; Mr. S. H. Laver, 4 lock-up shops, 12–15, Victoria Parade, London-road, Norbury; Mr. P. Richardson, garage, 24, Thornton-road; Mr. P. Richardson, alterations, Chatsworth-road, "The Limes"; Mr. H. E. Davey, alterations to garage, 113, Central-hill; Mr. C. E. Head, three closed garages and open store, Gladstone-road; Messrs. E. C. De Witt & Co., additional storeys to factory, Cherry Orchard road (at works); Messrs. Clout & Tysoe, garage, Silverleigh-road, rear of 125, Headcorn-road; Mr. J. Crowley, house, Glenthorne-avenue. *Temporary building*—Mr. W. E. Pritchett, garage, 109, Northwood-road (at side of).

DARLINGTON.—Plans have been passed by the Streets Committee for eight new houses—two in Thirlmere-road, Hopetown; four in Swinburne-road, one in Bruckburn-road, and one at Cockerton. The Housing Committee has decided to invite tenders for 50 new houses—25 at Cockerton, and 25 in the new road now being constructed to connect Neasham and Grange roads. With the object of providing more work for the unemployed, the Health, Sewerage and Streets Committees, at a joint meeting, decided to recommend the Council to proceed with the building of another sewer in a new district of the town. The work is estimated to cost about £30,000.

DARWEN.—The Building Committee of the T.C. have approved a plan for the rebuilding of that portion of the Wallpaper Company's premises destroyed by fire about 18 months ago.

DERBY.—The Special Purposes Committee of the T.C. have adopted a design for a town cenotaph to cost £5,000, and ask the Council to contribute £2,500. It is to be situated in St. Peter's Churchyard.

DOVER.—Plans for the erection of 13 houses at Whatfield-avenue, by Mr. W. Bromley, are before the T.C.

EDINBURGH.—In connection with the municipal housing scheme at Longstone, the Housing Committee has had before them a representation by the Director of Housing that two- and three-roomed houses should be built instead of the three- and four-roomed dwellings originally proposed. Under this new scheme, which is to go before the Board of Health for approval, there will be 48 houses of two rooms and 28 of three rooms.

GLASGOW.—The Dean of Guild Court has passed the following linings:—Mrs. Gertrude M. Cargill or M'Cowan and others, trustees for the Nurses' Memorial to King Edward VII Home for Aged and Retired Nurses for Glasgow and the West of Scotland, alterations and additions to home, Third-avenue, Dumbreck; Macfarlane, Lang & Co., Ltd., 38, Wesleyan-street, to erect a gatehouse, canteen, and other buildings at Clydeford-drive, Tollcross; Frederick Braby & Co., Ltd., Eclipse Works, Hobden-street, to make additions to premises for pickling at Petershill-road; James Watson, wright and builder, 494, Crow-road, Jordanhill, to erect twelve garage stances at that address; Broomhill Tennis Company, to erect a pavilion at Bishop's-road, Jordanhill; Clydesdale Bank, Ltd., to make alterations to premises at the corner of St. George's-road and West Princes-street; John Fitzpatrick, 38, Argyle-street, Maryhill, to erect temporary dwelling-house at Canniesburn-road, at River Kelvin; Corporation Parks Department, to erect football pavilions in Yorkhill Park, Glenconner Park, Garngad road, Moss Estate, Moss-road, Govan; Kelvingrove Park, and Dawsholm Park; Shaw (Glasgow), Ltd., Maryhill Iron Works, alterations to premises at Craigmont-street, Maryhill.

GLASGOW.—Plans have been passed for a new venture in the West End of Glasgow, which is to comprise a picture house, dancing hall, and tea rooms. The site is at the northern corner of Observatory-road and Byres-road, and it is to be named the Botanic Gardens Picture House. The plans show an imposing building, and it is the intention of the directors of the company which has been formed that the undertaking should be equipped and conducted on high-class lines. The picture house portion of the building will have accommodation for 1,300 persons.

HULL.—Plans passed by T.C.:—A. H. Wilkinson, two houses, Ferens-avenue; G. Armstrong, garage, 7, Bourne-street; A. A. Dunn, offices, Ryde-street; T. Holmes & Sons, Ltd., shed, Campbell-street; Reckitt & Sons, Ltd., lavatories, St. Mark-street; J. Thompson, alterations, 741, Holderness-road; Meadow Dairy Co., Ltd., additions, 185, Holderness-road; Goodson's, Ltd., alterations, 10, Savile-street; Reckitt & Sons, Ltd., verandah roof, St. Mark-street; Reckitt & Sons, Ltd., lean-to roof, Dansom-lane; H. Emms, pigstyes, 61, Haltemprice-street; A. M. L. Rowan, shop fronts, 413, Anlaby-road; J. Lowrie & Co., additions, St. James-street; R. Robson, alterations and additions, "Bowden View," Newland Park; W. Rippon, warehouse, Market-place; Rose, Downs & Thompson, Ltd., galvanising shed, Cannon-street; Riley's Dairies, Ltd., additions, William-street; F. W. Boulton, shop front, Hessle-road; Trustees, St. Mary's Church, additions, Wilton-street; National Union of General Workers, alterations and additions, Kingston-square; Hull Co-operative Society, Ltd., alterations, Cleveland-street; M. Belmont, steel building, Aberdeen-street.

LONDON (BATTERSEA).—The L.C.C. has sanctioned the borrowing of £3,000 by the B.C. for the reconstruction of a sewer in Bollingbroke-road.

LONDON (BERMONDSEY).—Plans passed:—Sanitary improvements at 42, Bermondsey-square, Messrs. G. Parker & Sons, for Messrs. W. Rankin & Sons.

LONDON (HAMMERSMITH).—Drainage plans passed by B.C.:—At 2, Stamford Brook-road, for Mr. W. Streater; at 1, Rayleigh-road, for Mr. G. H. Sykes; at 69, Iffley-road, for Mr. W. Morley; at 1–10, Rylett-crescent (new bungalows), for Mr. M. J. Allen.

LONDON (HOLBORN).—Negotiations are, it is stated, in an advanced state, and it is understood there is every likelihood that they will be satisfactorily completed, for the development of the extensive site of Messrs. Crosse & Blackwell's former factory in Charing Cross-road by the erection of a restaurant and possibly two cinemas and a club.

LONDON (KENSINGTON).—The L.C.C. has sanctioned the borrowing by the B.C. of £37,927 for housing purposes.

LONDON (LEWISHAM).—Plans passed by B.C.:—Additions to Park-View, Beckenham-lane, for Messrs. T. H. Sawyer & Son; workshop, &c., 80, Courthill-road, for Messrs. C. Cutler & Sons; 72 houses, Bellingham Estate, for the L.C.C.

LONDON (ROTHERHITHE).—New street to lead from Morgan's-lane to English Grounds, for Pilchers, Ltd.

LONDON (STOKE NEWINGTON).—Drainage plans passed by B.C.:—Mr. E. Clayden, at 14, Grangecourt road; Messrs. T. Gates & Sons, at 13, Grangecourt-road; Messrs. Sabey & Sons, at 21, Albion-road; Messrs. Charles Skinner & Son, at 8, Park-crescent.

LONDON (WANDSWORTH).—Plans passed by B.C.: Messrs. W. Adkins & Son, redrainage of cottage, Mount Clare, Roehampton-lane, Putney, and redrainage of 34, Medfield-street, Roehampton; Mr. E. J. Partridge, alterations and additions, 188, Upper Richmond-road, Putney; Messrs. Collins & Sons, redrainage of 19, Larkhall Rise, Clapham North; Messrs. Shakeshaft & Wightman, redrainage of 59 and 61, Tonsley Hill, Fairfield; Mr. C. Ash, garages, Grafton-square, Clapham North; Messrs. J. Harrison & Co., lock-up shop on railway land, Sternhold-avenue, Streatham; Messrs. Crabb & Son, redrainage of 10, Stockfield-road, Streatham; Mr. A. Bretzfelder, shops, 107 and 109, High-street, Wandsworth; Mr. H. Harding, motor house, 64, Elmbourne-road, Balham; Messrs. Richards-Stone, Ltd., drains, Tooting Conservative Club, Ashvale-road, Tooting.

MALDON.—Plans approved by T.C.:—Pair of semi-detached bungalows, Spital-road, for Mr. B. T. Annerlan.

NELSON.—Plans passed by T.C.:—Club room, Brunswick-street, for the British Legion of ex-Service men; Messrs. T. Fletcher & Son, alterations at Dale Mill; Mr. H. Threlfall, garage, 8, Terry-street; Mr. J. Clegg, garage, Back Holly-street; Mr. Shaw, workshop, Woodlands-road; Mr. H. Nelthorpe, garage, Back Walton-lane; Mr. R. Maden, garage, School-road.

PRESTON.—Plans passed by T.C.: Mr. John Corbishley, bay windows, 168 and 170, North-road; Messrs. James Byrom, Ltd., for Messrs. Sharp, Ltd., garage, Long-lane; Messrs. G. Chester & Sons, for Mr. G. Burton, bay window, Garstang-road; Mr. A. J. T. Ellison, for Mr. F. Smith, billiard hall, Ribbleton-lane; Mr. Richard Parkinson, lock-up shop, Eldon-street; Mr. F. F. Austen, for Mr. E. Bradshaw, garage, St. Wilfred's-street; Mr. A. H. Dewhurst, store, &c., Cottam-lane; Mr. F. Howorth, for Mr. C. H. Haycraft, warehouse, Waterloo-road; Mr. F. Howorth, for Mr. J. W. Balmer, garage, Lords-walk; Mr. J. E. Ingham, shed, Manchester-road; Mr. E. A. Wignall, workshop, 101, Peel Hall-street; Mr. W. H. Francis, shed, Tulketh-road, Ashton Hostel; Mr. A. J. T. Ellison, shop front, 135, Church-street; Mr. T. Croft, jun., extension to garage, Tulketh-road; Mr. H. Shuttleworth, wash-house, 47, Fishwick-parade; Mr. W. D. Standen, alterations and additions, Richmond-street, "Black Lion" Hotel; Mr. B. D. Holmes, shop front, Ormskirk-road; Mr. W. C. & J. H. Mangan, shed, Brook-street; Mr. F. Jackson, for Mr. D. Traynor, alterations, 5, Great Avenham-street.

ROMSEY.—The Southampton E.C. has decided to provide temporary school accommodation at an estimated cost of £3,300.

SALFORD.—Plans passed by T.C.:—Construction of bioscope box and winding room, Salford Hippodrome, Cross lane, Salford; sanitary accommodation, Cheltenham-street, Pendleton; ten dwelling-houses, Beeley-street, Pendleton; alterations to store under railway arch, Blackfriars-road, Salford; additions to Nurses' Home, "Oakwood," Radcliffe Park-road, Pendleton; construction of store, Anderton's-place, Broughton; sanitary conveniences, Duke-street, Broughton; sanitary accommodation, George-street, Salford; petrol store, 8A, Broad-street, Pendleton; garage, 144, Bolton-road, Pendleton; sanitary accommodation, Kingston Mills, Cobden-street, Pendleton; washhouse and extension of w.c., 18, Bayford-road, Pendleton; sanitary accommodation, Cromwell-road, Pendleton; drainage system, "Oakwood," Radcliffe Park-road, Pendleton; alterations to Seedley Cinema, Langworthy-road, Pendleton; additions to sanitary accommodation, "Manor Inn," Church-street, Salford; calculations for reinforced concrete work, Ordsall-lane, Salford.

SKEGNESS.—A scheme prepared by Mr. E. G. Silcock for the enlargement of the sewage works at an estimated cost of £15,500, has been approved by the U.D.C.

SOUTH AFRICA.—H.M. Senior Trade Commissioner at Johannesburg reports that a tuberculosis sanatorium is to be erected at Nelspoort, Cape Province. The entire scheme has been designed by the Public Works Department. The work included in the first part of the scheme is to cost about £53,000. United Kingdom manufacturers and exporters can obtain the name and address of the contractors carrying out the work on application to the Department of Overseas Trade, 35, Old Queen-street, London, S.W.1.

SOUTHEND-ON-SEA.—Plans passed by T.C.:—bungalow, Fleetwood-avenue, for Mr. A. Berry; bay window, "The Vicarage," West-street, Prittlewell, for the Rev. Canon E. N. Gowing; strong room, Hamlet Court-road, for the National Provincial and Union Bank, Ltd.; two flats and garages, South-avenue, for Mr. W. Letton; three houses, London-road, for Mr. J. R. Marshall; bathroom, 86, Leigh-hill, for Mr. E. Thorp; sanitary improvements, Lindisfarne College, Valkyrie-road, for Mr. A. E. Saunders; three houses, Glenwood-avenue, for Messrs. P. & D. Barham; alterations and additions, "Grand" Hotel, Broadway, Leigh, for Mr. S. J. Tinner; additions, "Heathview," London-road, for Mrs. E. Cross; new shop front, 32, Marine-parade, for Mr. J. Bright; additions, "Abbasia," Inverness-avenue, for Mr. J. Roberts; verandah, Eastwood-lane, for Albany Electric Laundry Co., Ltd.; alterations, 77, Southchurch-road, for Mr. T. Jacobs; house, Crescent-road, for Mr. J. E. Wilcher; house, Cossington-road, for Mr. S. H. Burnham; billiard room, Masonic Hall, High-street, for the Directors of Masonic Club Co.; bungalow, Nelson-road, for Mr. H. Lummis; three houses, Dundonald-drive, for Mr. H. Watson; additions, 1, Wenham-drive, for Mr. H. Posner; conservatory, 50, Moseley-street, for Mr. A. J. Lukings; workshop, 17, Milton-street, for Mr. J. Manning; additions, Imperial-avenue, for Mr. D. B. Peart; office and store, Westborough-road, for Mr. A. Butters; bungalow, St. Benet's-road, for Mr. J. S. Walker; bungalow, Madeira-avenue, for Mr. S. Baker; workshop, Queen's-avenue, for Mr. S. Verlander; workshop and store, rear of Hamlet Court-road, for Mr. H. J. Bell; bungalow,

* See also our List of Contracts, Competitions, etc

Hadleigh-road, for Miss M. Reeves; conversion of house into shop, 865, London-road, for Miss Kelsey; additions, 102, Alexandra-road, for Miss M. Withers; six houses, Dawlish-drive, for Mr. A. Widley; conservatory and covered way, 50, Grange-road, for Mrs. Y. Fenwick; house, Colbert-avenue, for Mr. R. Collier; conversion of college into flats, St. John's College, Westcliffe-parade, for Mr. P. Raven; garage and additions, 70, Southview-drive, for Mr. Wyman; bungalow, Duke of Manchester-drive, for Mr. J. G. Daniels; bungalow, Shanklyn-drive, for Mr. J. E. Johns; additions, 22, St. Vincent's-road, for Mr. J. F. Woods; garage, Chalkwell-avenue, for Mr. W. H. Fuller; garage, "Benhilton," Drake-road, for Mrs. E. Hobbs; store, Leigh-road, for Messrs. Wiltshire & Bass; bay window, "The Nook," Martyn-grove, for Mr. H. E. Bishop; two bungalows, Fairmead-avenue, for Mr. H. E. Harrowing; garage, Eastwood-road, for Mr. G. Banfield; house, Glendale-gardens, for Mrs. A. Boyes; two bungalows, Leigh-gardens, for Mr. H. R. Jacobs; additions, 29, Seaforth-road, for Mrs. E. M. Hughes; alterations and additions, 9, Royal-terrace, for Dr. S. Bridger; motor garage works, 18, London-road, for Mr. H. Brown; three bungalows, Leighton-avenue, for Mr. G. W. Eves; house and shop, London-road, for May's Dairies, Ltd.; house, Herschell-road, for Mr. R. M. Nixon; conservatory, 114, Southchurch-road, for Miss M. N. Fewing; alterations to drainage, Carlton-avenue, for Mr. W. Warman; additions, 9, Southchurch-road, for Mr. J. R. Tomkins; house, First-avenue, for Mr. P. H. Evans; house, Pall Mall, for Mr. J. Joy; new shop fronts, 172 and 174, London-road, for Mr. S. H. Simons; two houses, Crescent-road, for Mr. H. Constable; bungalow, Gordon-road, for Messrs. Twitchet & Higgins.

STOCKTON-ON-TEES.—Plans have been approved by the U.D.C. for the erection of six semi-detached houses in Mowbray-road, off Victoria-avenue, Norton, for Mr. J. W. Bainbridge, Queen-street, Redcar.

TYNEMOUTH.—Plans passed by T.C.: Alterations, 8, Church-street, and No. 6, Dockwray-square, by Mr. G. W. Landells, for Mr. Butcher; motor garage, Chirton-green, Chirton, by Mr. W. Stockdale, for Mr. J. Scott; nine dwelling houses, Hotspur-street, Tynemouth, by Mr. W. Stockdale, for Mr. Benjamin Peel; alterations, 64, King-street, North Shields, by Messrs. Hope & Tasker, for Mr. H. D. Burton; alterations, "Rising Sun" Inn, Beacon-street, by Messrs. F. R. N. Haswell & Sons, for Mr. J. Ewan; alterations, 45 and 47, Simpson-street, Cullercoats, by and for Mr. T. Finlay; semi-detached villas, King Edward-road, by Mr. J. R. Wallace, for Mr. H. D. Burton.

TYNEMOUTH.—The Roads Committee has approved plans by the Borough Engineer for the utilisation of Spring Terrace field as a recreation ground, at an estimated cost of £4,000.

WAKEFIELD.—Plans passed by T.C.: Messrs. Newbald & Hartley, garage, store, and showroom, and conversion of house and shop and lock-up shop into two houses and shops in Westgate and White's-yard, for Mr. C. Woods; Mr. J. P. Firth, new-street, off Alverthorpe-road, for Messrs. A. Haley & Co., Ltd.; Mr. W. H. Ogden, office to garage in Sanderson-street and Brunswick-street, for Messrs. Fotherby & Co.; Mr. W. H. Ogden, six lock-up garages in Hambleton-street and Tavora-street, for Mr. Armstrong; Mr. J. R. Lister, additions to sugar boiling works in Elderrove for Messrs. N. H. Charlesworth & Co., Ltd.; Messrs. Bell & Kaye, drainage to house in Carr-lane, for Messrs. Nicholson & Briggs; the Diamond Coal Cutter Co., store to Stennard Works, in Kirkgate; Mr. F. Simpson, alterations to the Woolpacks Hotel, in Woolpacks-yard and Barstow-square, for Mr. W. Townend; Mr. H. Dobson, alterations and additions to lock-up shop in Denby Dale-road and Thornes-lane, for Mr. H. C. Taylor.

WARRINGTON.—Plans for a sub-station, proposed to be erected by the Corporation, in Grappenhall-road, Latchford Without, have been passed by the Runcorn R.D.C. Although the plans were approved it was decided to ask the Corporation to consider erecting the building on an alternative site.

WINCHESTER.—Approval has been given for the Southampton C.C. to the plans of the County Architect for the erection of an additional hall at the County School for Girls, at a cost of £1,000.

WORTHING.—Plans passed by T.C.: Workshop, Ashdown-road, Mr. T. R. Hyde, for Mr. H. C. Waller; addition to "Woodcote," Shakespeare-road, for Mr. H. Baker; dwelling house, Highdown-avenue, Mr. A. Clare, for Mr. Trudgett; workshop and showroom, Broadwater-road, for Mr. E. Pinker; lock-up garages, 3, 4, and 5, Buckingham-road, for Mr. B. Cheal; additions, 23 and 25, Chapel-road, Messrs. F. Sandell & Sons, for Mr. B. Baker; four garden sheds and garage, Parkfield-road, for Mr. A. E. Child; shed, 198, Tarring-road, for Mr. A. R. Kennard; alterations, 31, South-street, Messrs. Bostel Bros., Ltd., for Mr. Ferrari; garage, New-street, Mr. R. Jupp, for Messrs. Potter & Bailey, Ltd.; shed, South Farm-road, for Mr. F. C. Abell; house, Georgela-avenue, for Mr. A. Clare; garage, "Riversdale," Mr. H. M. Potter, for Mr. C. W. Collier.

FIRES.

DUNFERMLINE.—A destructive fire has occurred in the motor garage premises of Messrs. Blaik & Reid, North Station-road.

HUDDERSFIELD.—A fire has occurred at the works of Middlemost Bros. & Co., Clough House Mills.

LINCOLN.—The extensive three-story building of Messrs. Curtis & Mawer, Ltd., cabinet makers, upholsterers, &c., 40, Silver-street, has been destroyed by fire.

TODMORDEN.—Todmorden Corporation Market Hall a block of property containing over forty shops, was in danger of being destroyed by fire last week. The shop of Mr. Joseph Heighton, provision merchant, of Bradford, was gutted.

TRADE NEWS.

The Considere Construction Co., Ltd., designers in reinforced concrete, have moved from 5, Victoria-street to 72, Victoria-street, S.W.1. Telephone, Victoria 3033.

We have received from Messrs. E. Hill Aldam & Co., of 45–50, Holborn Viaduct, E.C.1, a new list illustrating and describing their "Quality" lavatory and bath cocks.

Mr. W. H. Sawyer, of 22, Sudbourne-road, Brixton-hill, S.W., has entered into an arrangement to represent Messrs. O'Brien, Thomas & Co., in the London and suburbs area as traveller.

Mr. H. W. Burrow informs us that there is no truth in the report that he has severed, or is about to sever, his connection with the Ragusa Asphalte Co., Ltd.

The whole of the sculpturing and carving in Ancaster stone for the Lincoln war memorial, 35 ft. high, designed by Mr. M. A. Hall, architect, of Lincoln, has been entrusted to Messrs. M. Tuttell & Son, sculptors, Lincoln.

We are asked to state that the "Keystona" varnish used in the new County Hall was supplied by Messrs. Heffer, Scott & Co., Ltd., who are the sole agents for the London area.

The telephone numbers of Messrs. James Latham, Ltd. (timber merchants and importers), of 124, Curtain-road, E.C.2, have been altered from London Wall 1185, 1186, to Bishopsgate 1922, 1923 and 1924.

"Guarding the Minute" is the title of a booklet issued by the International Time Recording Co., Ltd., of 57, City-road, E.C.1, which contains illustrations and descriptions of a great variety of automatic time-keeping and costing systems adapted for various trades.

Messrs. Wm. Moore & Co., of 1, Lauderdale Buildings, Aldersgate, E.C.1, inform us that they have in stock large quantities of dust cover sheets in various sizes. Messrs. Moore have specialised in the manufacture of dust cover sheets for the past thirty years.

The final transfer of the staff of Nobel Industries, Ltd., to Nobel House, Buckingham-gate, S.W. 1, has now been completed. The head office at No. 6, Cavendish-square, W. 1, has been closed, and all business and correspondence is now being conducted from the new headquarters of the Company.

Messrs. Ruston & Hornsby, Ltd., have secured a contract from the Government of South Africa for thirty-eight heavy oil engines, to be supplied to the South African Railways and Harbours Department for driving grain elevators and for electric lighting purposes in different parts of the country. The order, which is understood to be for approximately 2,500 brake horse-power, was secured after severe competition.

The great demand for houses at short notice at the conclusion of the war attracted the attention of many inventors and others, and innumerable systems and methods were put forward with the object of helping builders in their task by the simplification of house construction. Some of these methods and materials were tried and failed, whilst others have survived to be of considerable service in the production of a well-built house at a reasonable cost. In the latter class is "Poilite," an artificial stone, composed of fibrous asbestos and Portland cement, manufactured by Messrs. Bell's United Asbestos Co., Ltd., of Southwark-street, S.E.1. This material, which is described and its uses illustrated in a booklet entitled "How Poilite helps the Builder," is supplied in flat and corrugated sheets for exterior and interior walls and ceilings, and in the form of tiles of standard sizes for roofs. By the use of "Poilite" a great deal of labour on the site is saved; it is light and easily handled, fireproof, and easily fixed. The surface is such that plastering is unnecessary, and excellent interior effects can be obtained with its use in various tints. A pair of houses in which "Poilite" and "Hurcan" slabs (also manufactured by Messrs. Bell's) have been used, and for which Mr. Harold Sayner is the architect, are illustrated in this issue, p. 3.6.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us not later than Tuesday evening.

***Denotes *accepted*. † Denotes *provisionally accepted*.**
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modifications*.

BISHOPSTOKE.—For (*a*) alteration to offices at Council School; and (*b*) new offices for boys, for the Southampton C.C.:—

*(*a*) W. A. Fussell	£166 2 6
*(*b*) H. Faulkner	147 13 0

BLAIRGOWRIE.—For new workshop at Union-street, for Mr. Jas. Clark. Mr. J. A. R. Macdonald, Burgh Surveyor:—

*J. & W. Bruce, Coupar Angus (*Mason*).
*Ross & Wallace, Coupar Angus (*Joiner*).
*Jas. Clark, Coupar Angus (*Plumber*).
*Geo. G. Mann, Coupar Angus (*Slater*).

BLANDFORD.—For erection of a swimming bath, for the T.C. Mr. R. W. Ashman, Borough Surveyor, Blandford:—

Frank Bevis, Ltd., Portsmouth	£2,484
Playfair & Toole, Southampton	2,205
R. G. Spiller, Sherbourne	1,579
Unit Construction Co., London	1,413
H. S. Hamilton, Bristol	1,390
Wise & Lansdell, Salisbury	1,389
F. W. Brickell, Blandford	1,365
C. T. Tucker, Bristol	1,352
Munday & Sons, Ltd., London	1,342
S. Ambrose, Bath	1,321
J. Francis, Bournemouth	1,290
Campbell Kenyon & Co., Acton	1,225
Bird & Peppara, Yeovil	1,213
Co-Operative Society, Ltd., Parkstone	1,165
S. Gidlow, Bournemouth	1,136
Dunthorne, Ltd., Glastonbury	1,131
National Building Guild, Manchester	1,107
*Theo. Conway, Ltd., Weymouth	1,063

BRIGHTON.—For (1) construction of winding shaft and connecting heading at Mile Oak pumping station; and (2) extending existing headings, for the T.C.:—

*Geo. Stow & Co., Newport	(*a*) £1,669 10 (*b*) £2 10 per yard.

BRIGHTON.—For removing sheds, &c., at Golf pavilion at Hollingbury Park, and refitting of new pavilion, for the T.C.:—

*Field & Cox	£273

CADDAM.—For new sewage main at Caddam housing scheme, for the T.C. Mr. J. A. R. Macdonald, Burgh Surveyor, Coupar Angus; quantities by Surveyor:—

Excavator, pipes and fittings—
*J. & W. Bruce, Coupar Angus.

CAMBRIDGE.—For supply of three gullev carts, for the T.C.:—

Headly & Edwards	£55 15 each
A. Macintosh & Sons	50 0 „
*Eagle Engineering Co.	46 0 „
Tuke & Bell	44 0 „

CLACTON-ON-SEA.—For additional shops and tea-room, for Clacton Corner House, Ltd. Mr. G. H. B. Gould, Station-road, Clacton-on-Sea:—

T. & J. Gabb, Ltd., London	£3,185 0
W. Ovenden, Frinton-on-Sea	2,983 0
J. Glover & Co., London	2,800 0
R. Woolaston & Co., London	2,760 0
F. W. King, Clacton	2,654 0
Jas. White, London	2,600 0
G B. Farrar & Co., London	2,600 0
W. J. Grant & Co., Clacton	2,595 0
W. Green, Frinton-on-Sea	2,522 0
W. J. Vaughan, Colchester	2,488 10
H. Smith & Sons, Clacton	2,469 10
Percy J. Turner, Ipswich	2,367 0
*Henry Potter, Chelmsford	2,275 0
E. J. W. Wilson, Stamford	2,200 0

EASTLEIGH.—For erection of 10 parlour-type houses, for the U.D.C. Messrs. Hair & Bird, architects, 23, Portland Chambers, Southampton:—

W. H. Whitehead & Sons, Eastleigh	£6,840 0
Mulhern & Welsh, Ltd., Alresford	6,740 0
Thomas Draper, Fareham	6,650 0
J. Bates & Son, Southampton	6,552 10
Jackson Bros., Eastleigh	6,149 5
Warwick & Co., Southampton	5,750 0
Poole & Son, Basingstoke	5,462 10
E. H. White & Son, Eastleigh	5,366 0
Jenkins & Sons, Ltd., Southampton	5,175 0

(Tenders to be submitted to the Ministry of Health.)

ELY (CARDIFF).—For finishing 24 houses, for the Corporation. Mr. E. J. Elford, City Architect, City Hall, Cardiff; quantities by City Architect:—

Newart Works, Ltd., Cardiff	£654 0 0
Meaker Bros., Abertillery	612 4 7
Knox & Wills, Cardiff	567 0 0
O. Newcombe, Cardiff	560 0 0
J. Wilkinson, Cardiff	550 4 11
E. R. Evans & Bros., Cardiff	548 2 2
R. E. J. Haines & Son, Cardiff	538 14 5
J. O. West, Whitchurch	537 12 0
S. I. Williams, Cardiff	536 3 1
T. Roberts, Cardiff	533 15 0
Evans, Whittle & Hancox, Cardiff	530 0 0
W. Symonds & Co., Cardiff	525 13 0
H. C. Edwards & Co., Cardiff	519 3 6
*C. Parker & Co., Cardiff	499 0 0

HAROLD COURT.—Construction of sewer at Harold Court Sanatorium, for the Essex C.C.:—

*Myall Bros.	£1,045 12 6

HULL.—For painting of Victoria Pier, for the T.C. :—

Campey Bros., Hull	£775 0
J. J. Hamilton, Louth	694 0
J. L. Broughton, Hull	300 0
*R. White & Son, Hull	274 10

LEEDS.—Erection of stores and workshops at Knostrop sewerage works, for the T.C. :—

*A. Mitchell	£11,119 0 2

LEEDS.—Supply of sludge pump, &c., at Knostrop sewerage works, for the T.C. :—

*Tangyes, Ltd.	£3,117

LEEDS.—Supply of chemical mixing plant, water tanks, &c., at Knostrop sewerage works :—

*Blakeborough & Sons	£2,524

LONDON.—For the execution of certain works at parks and open spaces on an actual cost basis with the addition of a percentage for profit, use of plant and overhead charges, for the L.C.C. :—

	Percentage addition to actual cost of works. —Thames— North	South	Both
C. J. Anderson, Poplar	20 ..	20 ..	20
Chittenden & Simmons, Ltd., Maidstone	— ..	13½ ..	11
Howard Farrow, N.W.11	9 ..	— ..	—
Henry Woodham & Sons, Ltd., Catford	8 ..	8 ..	7½
G. Bell & Sons, Ltd., Tottenham	6½ ..	7½ ..	7
Holland & Hannen and Cubitts, Ltd., W.C.1	7 ..	7 ..	7
John Mowlem & Co., Ltd., S.W.1	4½ ..	4½ ..	4½
Holliday & Greenwood, Ltd., Battersea	5 ..	5 ..	4½
*Trollope & Colls, Ltd., E.C.	5 ..	5 ..	4½

LONDON.—Re-erection of offices, &c., at the Chaucer School, Southwark, for the L.C.C. :—

H. King & Son, Peckham	£2,118 0 0
W. Mills & Sons, Ltd., Blackheath	1,751 0 0
Edwards Construction Co., Ltd., Eltham	1,666 0 0
Rice & Son, Stockwell (*in writing*)	1,605 0 0
(*in figures*)	1,565 0 0
Hill & Gurr, Bromley	1,544 0 0
Douglass, Halse & Co., Ltd., Woolwich	1,528 19 9
J. Marsland & Sons, Ltd., S.W.	1,460 0 0
Courtney & Fairbairn, Ltd., Camberwell	1,384 0 0
J. Garrett & Son, Balham	1,367 0 0
Prestige & Co., Ltd., S.W.	1,300 0 0
W. J. Dixon & Son, Bermondsey	1,194 0 0
*Triggs & Co., Clapham	1,072 0 0

LONDON.—For erection of a nursing home at 56–60, Hallam-street, W. Messrs. E. Howard & Partners, architects, 58, Pall Mall, S.W. :—

*E. A. Roome & Co., Ltd., Hackney.	

LONDON.—For roof glazing at Central Repair Depot, for the L.C.C. :—

W. Edgcumbe Rendle & Co., Ltd., S.W.1	£5,841 7 0
Helliwell & Co., Ltd., Brighouse	5,301 11 11
Ditto	5,122 19 4
F. Braby & Co., Ltd., N.W.1	4,849 19 11
The Pennycook Patent Glazing & Engineering Co., Ltd.	4,602 14 1
*British Challenge Glazing Co.	4,567 2 0
W. H. Heywood & Co.	4,565 3 0
H. Hope & Sons, Ltd., Smethwick (£4,794 18s. 1d., *less* 5 per cent.)	4,555 3 2
Hayward's, Ltd., S.E.1	4,527 2 0
P. & W. Anderson, Ltd., W.1	4,483 3 6
British Luxfer Prism Syndicate, Ltd., E.C.2	4,381 4 10½
Pennycook Patent Glazing & Engineering Co., Ltd., Glasgow	4,353 2 6
Mellowes & Co., Ltd., S.W.1 (£4,483 3s. 7d., *less* 5 per cent.)	4,259 0 5
W. H. Heywood & Co., Huddersfield	4,219 3 0
British Challenge Glazing Co., Stratford	4,180 7 0
Sunderland & Co., Ltd., Dewsbury	4,169 14 1

LONDON.—For foundations of dwellings on Goldsmith's-row site, for the L.C.C. :—

James Smith & Sons, Ltd., W.	£11,760
Brand, Pettitt & Co., N.	11,558
Fred & T. Thorne, Isle of Dogs	11,338
C. P. Roberts & Co., Ltd., Dalston	10,600
Rowley Bros., Wood Green	10,547
E. A. Roome & Co., Ltd., Hackney	10,483
L. H. & R. Roberts, Clapton	10,431
Holliday & Greenwood, Ltd., Battersea	10,349
James Carmichael (Contractors), Ltd., S.W.	10,142
Walter Jones & Sons, S.W.	10,092
Griggs & Son, S.W.	9,777
Patman & Fotheringham, Ltd., Islington	9,667
Prestige & Co., Ltd., S.W.	9,579
John Willmott & Sons, Ltd., Hornsey	9,444
Albert Monk, Edmonton	9,440
Walter Lawrence & Son, Ltd., E.C.	9,234
The Guild of Builders (London), Ltd., W.C.	9,199
*Allen Fairhead & Son, Enfield	8,725

LONDON.—For various works, for the L.C.C. :—

Queen Mary's Hospital—cleaning and painting works—

D. King, Ltd., Carshalton	£1,136 0 0
G. Giles & Co., W.	985 0 0
T. E. Joyce, Tooting	911 0 0
W. Watkin & Son, Ltd, E.C.	723 0 0
E. Dawe, S.W.	698 15 0
Edwards Construction Co., Ltd., Eltham	675 0 0
G. H. Miller, Ltd., Forest Gate	627 19 6
A. A. Secrett, Ltd., Wallington	603 0 0
H. Meckhonik, W.	555 0 0
D. C. Bowyer, Belvedere	548 6 0
J. E. Ree, Leytonstone	538 18 6
W. Hussey, S.W.	530 0 0
H. H. & F. Roll, Epsom	498 0 0
Hoad & Taylor, Horsham	485 0 0
H. A. Thomas & Son, Dulwich	480 11 0
G. S. Cook, Tooting	471 0 0
A. Black & Son, Forest Hill	456 0 0
J. S. Fenn, Woolwich	433 0 0
R. Mansell, Croydon	399 0 0
J. J. Woollaston, Tottenham	398 0 0
Douglass, Halse & Co., Ltd., Woolwich	398 0 0
F. & G. Foster, Norwood	389 0 0
Myall Bros., Ilford	388 13 7
A. Withey, Rotherhithe	355 10 0
*R. Haslam & Son, Woolwich	323 12 0

North-Western Hospital—covering hot water and heating pipes, &c.—

W. W. Kenyon & Sons, Ltd., Dukinfield	£331 7 11
T. Anderson, Ltd., Liverpool	312 2 8
Hobdell, Way & Co., Ltd., E.	297 14 5
G. Pidduck & Co., Ltd., E.C.	294 12 6
F. Leroy & Co., E.	277 11 6
Moler Fireproof Brick and Partition Co., Ltd., S.W.	269 10 8
C. Goodman & Co., Ltd., E.C.	262 18 0
J. W. Kitson & Co., Ltd., Blackwall	242 4 6
Lonsdale Bros., Ltd., Blackburn	249 0 10½
Reid, McFarlane & Co., Ltd., Plaistow	245 11 10
Newall's Insulation Co., Ltd., E.C.	236 11 11
Bell's Asbestos Co., Ltd., S.E.	231 11 5
Sutcliffe Bros. & Bryce, Ltd., Stratford	230 18 3
Ashby, Warner & Co., Ltd., Homerton	218 7 7
M. Keenan & Co., Ltd., Bow	203 4 2
W. McGowing & Co., Leyton	195 3 4
London Covering Co., Plaistow	194 4 2
*Pickles, Ayland & Co., Ltd., Ossett	190 2 6

Park Hospital—cells in the mortuary at the hospital—

Dowsett & Jenkins, S.E.	£170 0 0
J. Darch, Ltd., E.C.	159 0 0
W. J. Dixon, S.E.	158 0 0
*W. S. Sharpin, Bow	155 0 0

LONDON.—Supply of weighbridge at Rosebank Wharf, for the Hammersmith B.C. :—

W. & T. Avery, Ltd., London	£940 / 670
H. Pooley & Sons, London	831 / 621
Ashworth, Son & Co., Dewsbury	720 / 545
*S. Denison & Sons, Leeds	675 / 495
W. Hodgson & Sons, Manchester	510

LONDON.—Provision of boilers, &c., at Deptford Works, for the Metropolitan Water Board :—

Tinker, Shenton & Co., Ltd.	£5,718 0 0
William Arnold & Co.	5,550 0 0
Holdsworth & Sons, Ltd.	5,409 0 0
Vershure & Co.	5,000 0 0
Spurr, Inman & Co.	5,000 0 0
Tinkers, Ltd.	4,933 0 0
Wm. Arnott & Co	5,015 0 0 / 4,815 0 0
W. H. A. Robertson & Co., Ltd.	4,760 0 0
Clayton, Son & Co., Ltd.	4,950 0 0 / 4,750 0 0 / 4,650 0 0
Davy Brothers, Ltd.	4,480 0 0
Daniel Adamson & Co., Ltd.	4,476 0 0
Yates & Thom, Ltd.	4,409 0 0
Thomas Beeley & Son, Ltd.	4,482 10 6 / 4,332 10 6 / 4,322 10 6
H. & T. Danks (Netherton), Ltd.	4,315 0 0 / 4,245 0 0 / 4,155 0 0
J. & J. Horsfield, Ltd.	4,375 0 0 / 4,215 0 0
Galloways, Ltd.	4,197 0 0
J. & F. May	4,069 0 0
John Thompson (Wolverhampton), Ltd.	4,018 0 0
Edwin Danks & Co. (Oldbury), Ltd.	4,014 0 0
James Carmichael & Co., Ltd.	3,878 0 0
*Ruston & Hornsby, Ltd.	3,630 0 0 / 3,450 0 0 / 3,351 0 0 / 3,323 0 0

LOUGHBOROUGH.—For re-erection of stone wall adjoining the Rectory Grounds and Steeple-row, for the T.C. Mr. W. Granger, Acting Borough Surveyor, Town Hall, Loughborough :—

A. J. Wileman	£441
*T. Barker & Sons, Loughborough	335

NOTTINGHAM.—For levelling and laying a bowling green and two tennis courts, &c., for the T.C. Mr. T. C. Howitt, A.R.I.B.A., Housing Director, Trinity-square, Nottingham :—

*Hodsons, Ltd., London	£595

CONISBOROUGH.—For the erection of 32 houses, for the U.D.C. Mr. H. Thirlwall, Surveyor and Engineer, Church-street, Conisborough :—

	Class "A" Type 6, 8 houses.	Class "A," Type 7, 10 houses.	Class "B," Type 3, 12 houses.	Class "B" Type 5, 2 houses.	Total.
J. Done & Son, Balby	—	£6,790 0 0	—	—	—
Farrow & Moxen, Hexthorpe	—	6,400 0 0	—	—	—
R. H. Rawson & Son, Tickhill	—	6,050 0 0	£8,460 0 0	—	—
Rust Bros., Goldthorpe	£7,162 12 0	—	—	—	—
D. Smith & Sons, Stocksbridge	6,550 0 0	—	—	—	—
F. White, Mexbrough	5,869 0 0	—	—	—	—
Craig & Macdonald, Carlisle	6,013 5 6	7,346 15 0	9,747 11 6	£1,727 4 1	£24,834 16 1
M. Simpson & Sons, Hillsboro'	4,972 0 0	6,801 5 0	10,230 0 0	1,707 15 0	23,711 0 0
Makinson & Sons, Bolton	5,425 16 0	6,702 10 0	9,531 2 0	1,870 0 0	23,529 8 0
C. Sprakes & Sons, Doncaster	4,800 0 0	6,505 4 2	9,900 0 0	1,755 0 0	22,960 4 2
Meanley & Sons, Mexbrough	5,120 0 0	6,750 0 0	9,000 0 0	1,540 0 0	22,410 0 0
G. H. Smith & Sons, Mexbrough	4,800 0 0	6,555 0 0	8,700 0 0	1,600 0 0	21,655 0 0
Gelder Bros. & Woodcock, Pontefract	4,776 4 6	6,114 11 8	8,178 7 6	1,420 12 8	21,579 9 10
Fencing	—	—	—	—	1,089 13 6
Waddington Bros., Wath-on-Dearne	5,152 0 0	6,275 0 0	8,556 0 0	1,575 0 0	21,558 0 0
W. H. Fuller, Wath-on-Dearne	5,106 18 0	6,232 12 6	8,586 0 0	1,613 16 6	21,539 7 0
D. Brearley & Sons, Deepcar	4,926 0 0	6,200 0 0	8,454 0 0	1,461 0 0	21,041 0 0
A. J. Pugh, Rawmarsh	4,712 0 0	5,999 0 0	8,520 0 0	1,470 0 0	20,692 0 0
J. S. H. Randall, Ltd., Sheffield	4,784 0 0	5,980 0 0	8,388 0 0	1,534 0 0	20,686 0 0
Swift Bros. & Haslam, Doncaster	4,849 8 0	5,823 0 0	8,319 18 0	1,548 18 0	20,541 4 0
H. Dickenson, Rotherham	4,528 0 0	5,730 0 0	8,556 0 0	1,476 0 0	20,290 0 0
F. Bate, Doncaster	4,898 0 0	6,004 11 3	7,968 0 0	1,380 0 0	20,250 11 3
T. Jenkinson & Son, Doncaster	4,690 0 0	5,940 0 0	8,040 0 0	1,461 0 0	20,131 0 0
T. H. Wilburn, Ltd., Doncaster	4,280 0 0	5,975 0 0	7,950 0 0	1,520 0 0	19,725 0 0
Don Builders, Ltd., Doncaster	4,712 0 0	5,700 0 0	7,770 0 0	1,427 0 0	19,609 0 0
Dawson & Jones, Sheffield	4,448 0 0	5,870 0 0	7,740 0 0	1,536 0 0	19,594 0 0
A. E. Brown & Co., Grantham	3,984 0 0	6,062 10 0	7,897 10 0	1,414 10 0	19,358 10 0
Unit Construction Co., Liverpool	4,400 0 0	5,500 0 0	7,920 0 0	1,360 0 0	19,180 0 0
F. Hopkinson & Co., Ltd., Worksop	4,479 15 0	5,715 0 0	7,560 0 0	1,271 5 0	19,026 0 0
Pearson & Blackwell, Doncaster	4,390 0 0	5,340 0 0	7,970 0 0	1,300 0 0	19,000 0 0
Edwards & Co., Doncaster	4,416 0 0	5,735 0 0	7,380 0 0	1,415 0 0	18,946 0 0
Building Guild, Ltd., Manchester	4,264 0 0	5,683 2 6	7,365 0 0	1,448 16 0	18,760 18 6
Thompson & Dixon, Doncaster	4,260 0 0	5,600 0 0	7,500 0 0	1,365 0 0	18,725 0 0
Walters Bros., Balby	4,320 0 0	5,300 0 0	7,260 0 0	1,280 0 0	18,160 0 0
J. E. Greathead, Conisbrough	3,960 0 0	5,150 0 0	7,560 0 0	1,400 0 0	18,070 0 0
Stubbins & Fell, Sutton-in-Ashfield	4,092 0 0	5,375 0 0	7,140 0 0	1,210 0 0	17,817 0 0
Robinson Bros., Denaby Main	3,920 0 0	4,900 0 0	7,536 0 0	1,390 0 0	17,746 0 0
Flowitt & Gilbert, Doncaster	4,083 2 8	5,265 10 10	6,759 14 0	1,362 3 6	17,470 11 0
B. Pumfrey, Ltd., Gainsbrough	3,920 0 0	5,000 0 0	6,540 0 0	1,250 0 0	16,710 0 0
Smith & Hawley, Grimesthorpe	3,747 5 4	4,919 0 0	6,675 15 0	1,247 0 0	16,589 0 4
*G. Senior, Conisbrough	3,840 0 0	*4,800 0 0	7,620 0 0	1,460 0 0	17,720 0 0
*R. Lehane & Co., Ltd., Darley Dale	*3,400 0 0	4,796 5 0	*6,438 0 0	*1,190 4 0	15,824 9 0

LONDON.—For asphalte paving works, for the Hackney B.C. :—

	Sq. yards.	Val de Travers, Asphalte Paving Co., Ltd.	Limmer & Trinidad Lake Asphalte Co., Ltd.	*French Asphalte Co., Ltd.
		Price per sq. yard.		
Brooksby's-walk	2,230	12s. 3d.	12s. 0d.	12s. 0d.
Chatsworth-road	2,800			
High-street, Homerton	1,450			
		Price per sq. yard per annum.		
Maintenance for 10 years after the expiration of one year's free maintenance, in accordance with the provisions in the Specification		6d.	6d.	6d.

PAIGNTON.—For erection of semi-detached houses at Paignton, for Mrs. R. M. Fetherbridge and Miss Phillips. Mr. J. C. Beare, architect, 42, Devon-square, Newton Abbot; quantities by the architect:—

Thos. Vanstone & Sons, Torquay	£4,777	10	0
A. E. Brock, Torquay	4,596	11	10
Jones & Ely, Paignton	4,470	10	0
Willcocks & Barnes, Paignton	4,329	1	6
H. Maunder & Sons, Paignton	4,222	14	11½
W. Smaridge, Paignton	3,982	0	0
Melhuish & Berry, Paignton	3,867	8	7
S. Batten, Paignton	3,783	0	0
F. J. Zealley & Son, Newton Abbot	3,539	0	0
S. J. Webber, Paignton	3,519	0	0
*William J. Jury, Paignton	3,502	9	0
R. E. Narracott, Torquay	3,276	0	0
¶H. C. Jackman, Torquay	2,058	14	0

(¶ *For one house only*).

REIGATE.—For laying about 1,600 yds. of 12 in., 9 in., and 6 in. sewers at Horley, for the R.D.C. Messrs. T. R. & V. Hooper, surveyors, Market Hall Buildings, Redhill:—

G. Martin, Redhill	£6,900
H. B. Rudd, Horley	6,213
Economic Structures Co., London	5,422
Walter Jones & Sons, London	5,025
J. M. Blaker, Leatherhead	4,583
Kirk & Randall, Ltd., London	4,558
Wareham & Johnson, London	4,512
F. W. Young & Son, London	4,492
H. Boot & Sons, Ltd., London	4,287
Franks Harris Bros., Ltd., Guildford	4,172
Faulkner, Reigate	4,009
Edward Yewen, Croydon	3,979
S. Hall, Bromley	3,720
G. P. Trentham, Ltd., London	3,715
C. V. Buchan & Co., Ltd., Southwick	3,676
Alfred Hardy & Co., Woking	3,542
James Bodle, Ltd., Eastbourne	3,519
J. J. Pink, Merstham	3,420
John Mowlem & Co., Ltd., London	3,384
Turner & Payne, London	3,274
H. Streeter, Croydon	3,254
Graham Denney & Co., Ltd., London	3,111
*Parker & French, London	2,965

SALFORD.—Erection of transformer station at Heaton Park, for the T.C.:—

S. P. Bidder & Co., Manchester.. £193 3 2

SALFORD.—Construction of foundations for boilers for the Electricity Department, for the T.C.:—

*W. Turner (Ardwick), Ltd..... £1,444 3 3

SALFORD.—For making up footpaths and macadamising nine streets on the Weaste housing estate, for the T.C.:—

*Bethell & Sons, Sale..... £6,796 9 2

SALFORD.—For supply of 8-ton steam roller and scarifier, for the T.C.:—

*Aveling & Porter..... £1,217 14

SALONIKA.—It is reported that a provisional contract for the sewers in connection with the reconstruction of the town of Salonika has been secured by Sir Robert McAlpine & Sons, Ltd., of Huddersfield and London. The sum involved is about 17,000,000 drachmas, or approximately £180,000 at the present rate of exchange. The contract relates to the restoration of the central portion of the town, which was totally destroyed by fire in 1917. Some 200 acres of new streets and buildings are to be constructed.

SCOTBY.—For erection of two houses at Scotby. Mr. H. H. Hodgkinson, architect, 64, Lowther-street, Carlisle:—

Carpenter and joiner—
Craig & Macdonald, Carlisle..... £325 0
Plasterer—
Executors of D. Johnston, Carlisle.. 73 0
Plumber—
M. Stewart Carlisle 76 0
Decorator—
R. S. Kirk, Carlisle 33 0
Tiler and slater—
J. Hewitson, Carlisle 82 8

SOUTHEND-ON-SEA.—For laying two bowling greens at Chalkwell Esplanade, for the T.C.:—

*Hodsons, Ltd., Nottingham..... £650

SOUTHEND-ON-SEA.—Supply of steelwork required in connection with erection of buildings at Maldon-road tramway depôt, for the T.C.:—

*James Allen & Sons, Glasgow.. £390 13 6

SOUTHEND-ON-SEA.—Supply of stonework in connection with erection of West-road convenience, for the T.C.:—

*P. Smith, Southend-on-Sea.... £133 7 6

SPALDING.—For laying of water mains, for the R.D.C.:—

*Walling, Bourne £1,930

TREDEGAR.—For construction of 2 recording gauge houses, for the U.D.C. Messrs. John Taylor & Sons, engineers:—

*The Building Guild, Ltd. (United Valleys Area), Blackwood.... £358 15

WALLASEY.—Laying 1,600 yards of reinforced concrete, for the Gas Committee of the T.C.:—

*J. A. Milestone, Wallasey..... £693 6 8

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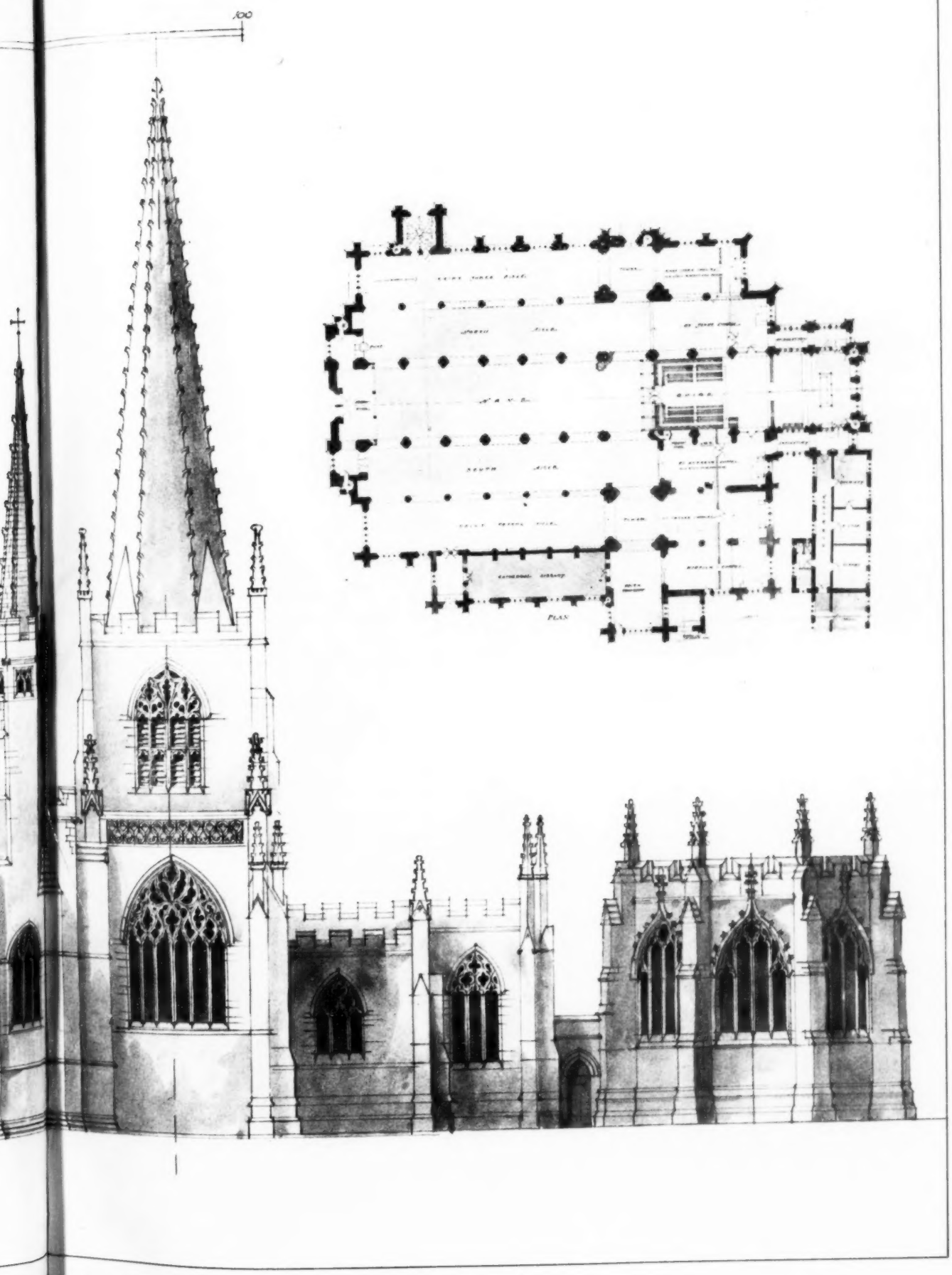
10 5 0 10 20 30 40 50

SCALE OF ONE INCH TO EIGHT FEET

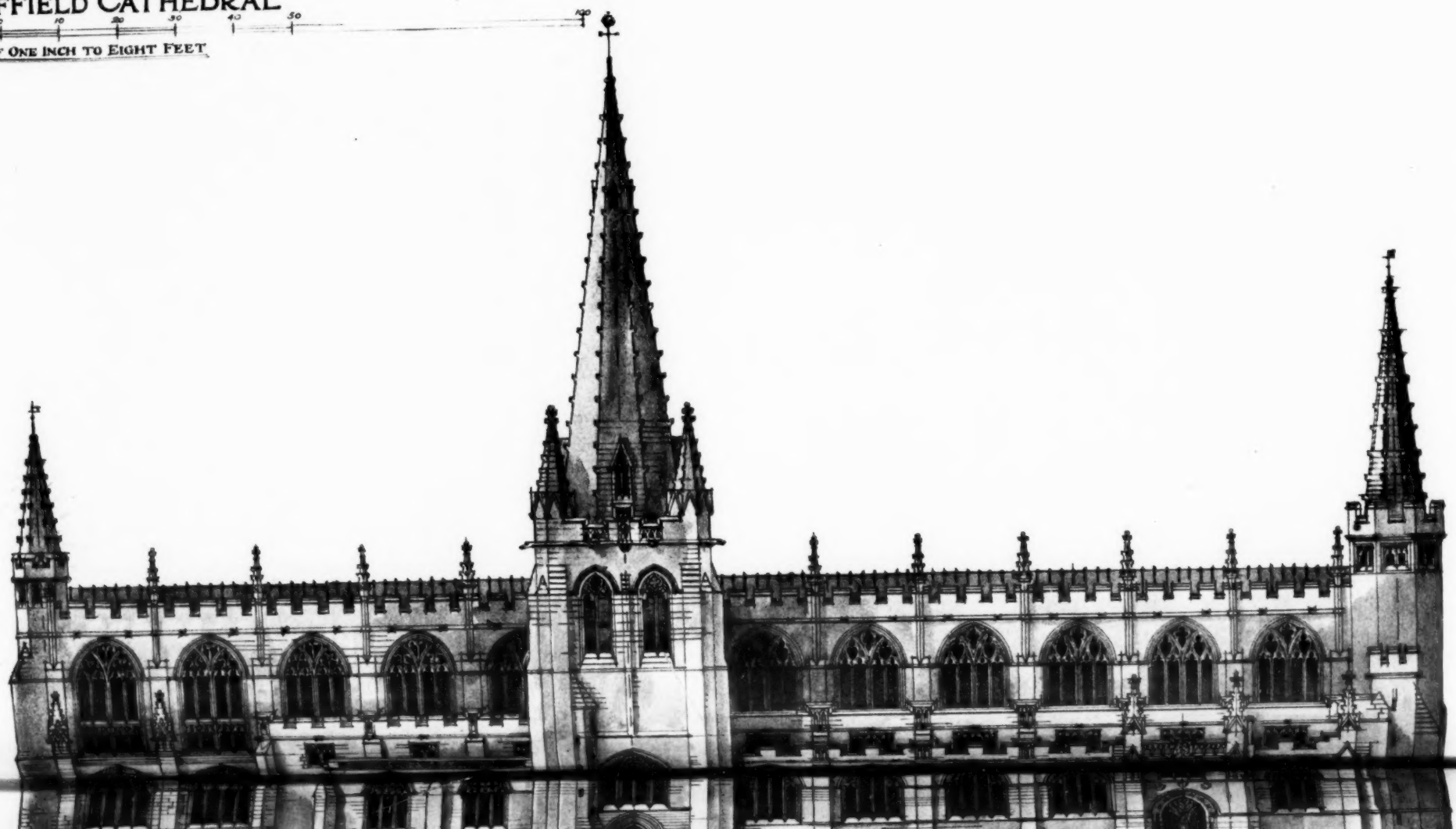
WEST ELEVATION



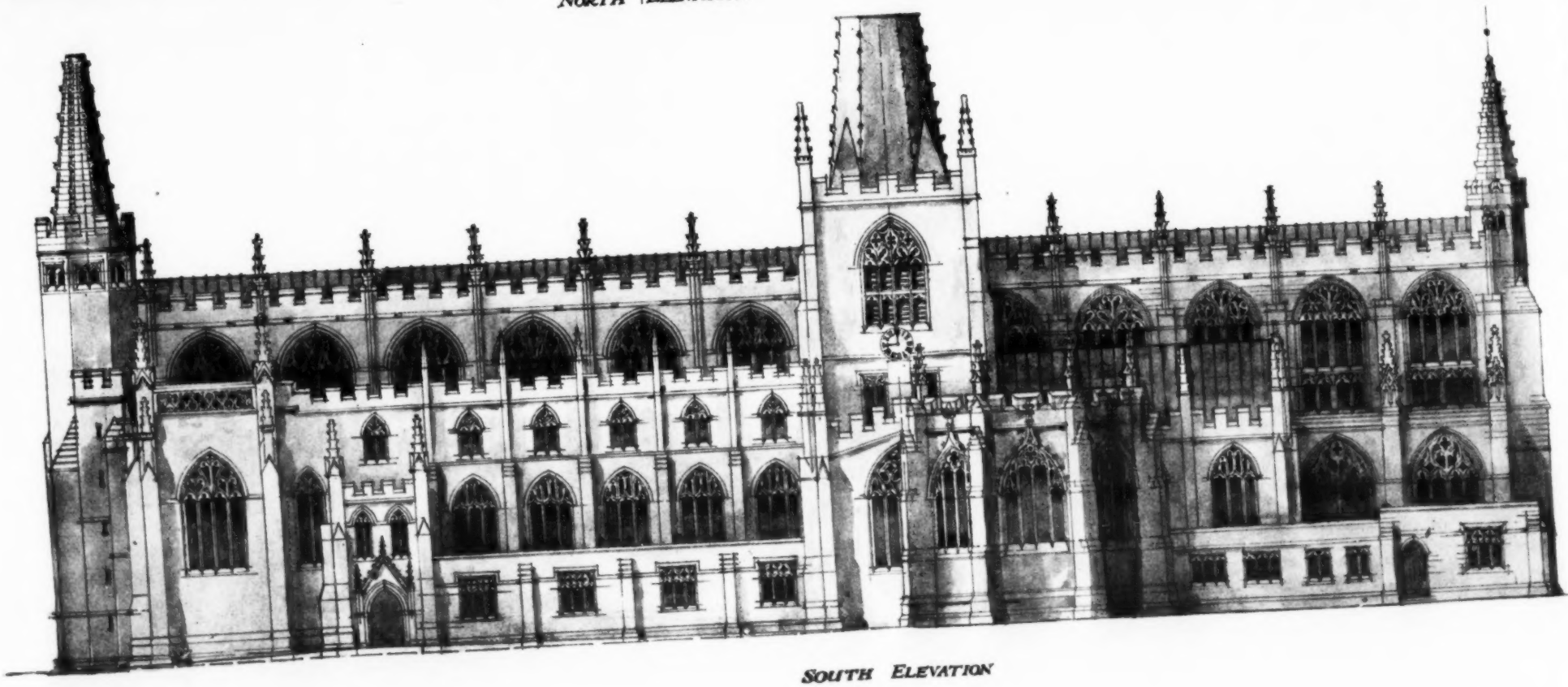
PLAN

SHEFFIELD CATHEDRAL

SCALE OF ONE INCH TO EIGHT FEET



NORTH ELEVATION



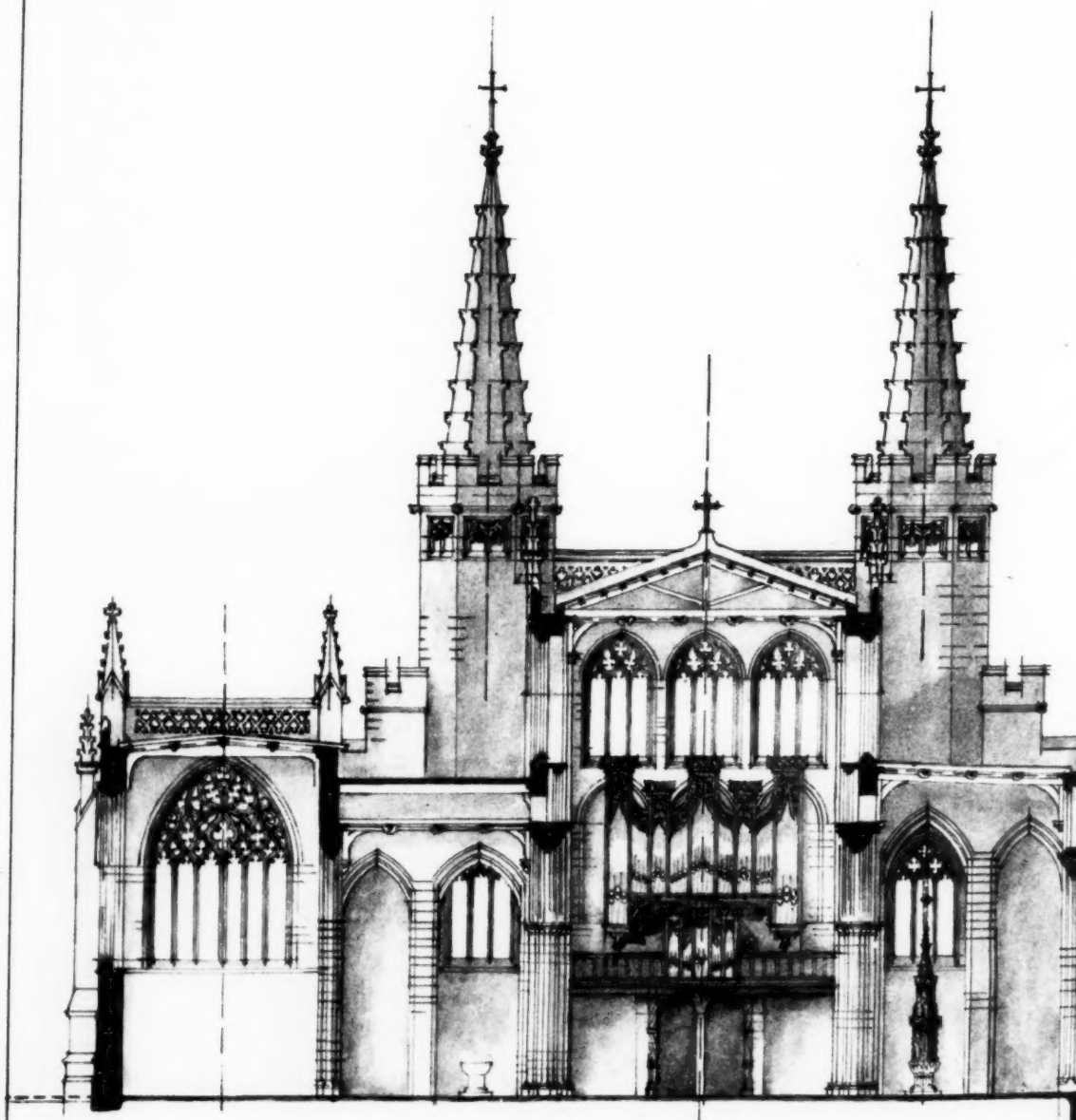
SOUTH ELEVATION

SIR CHARLES A. NICHOLSON, BART., F.R.I.B.A., ARCHITECT.

SHEFFIELD CATHEDRAL

10 5 0 10 20 30 40 50 100

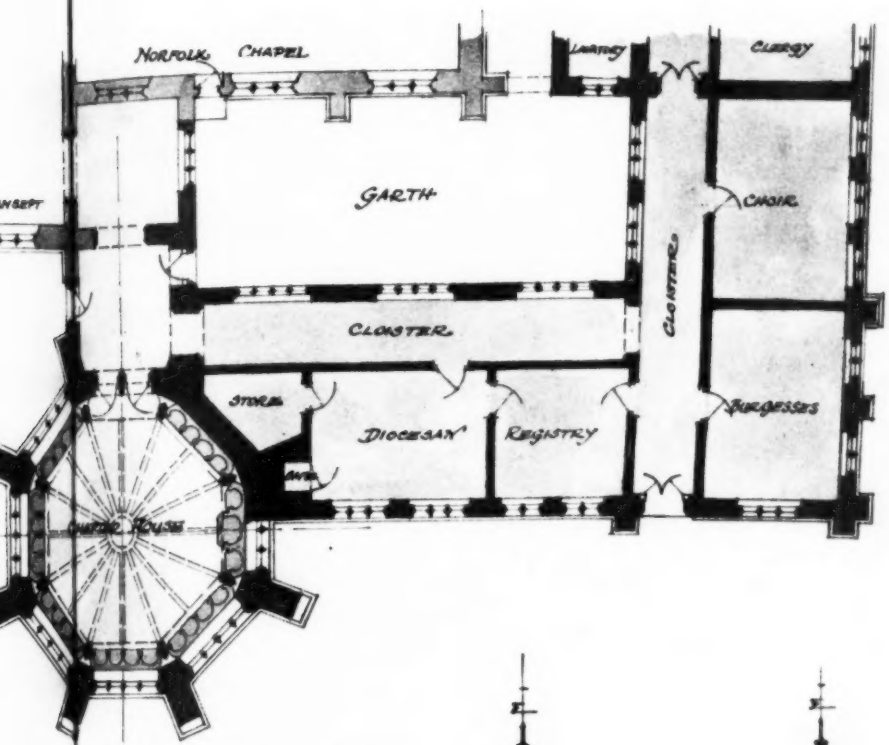
SCALE OF ONE INCH TO EIGHT FEET



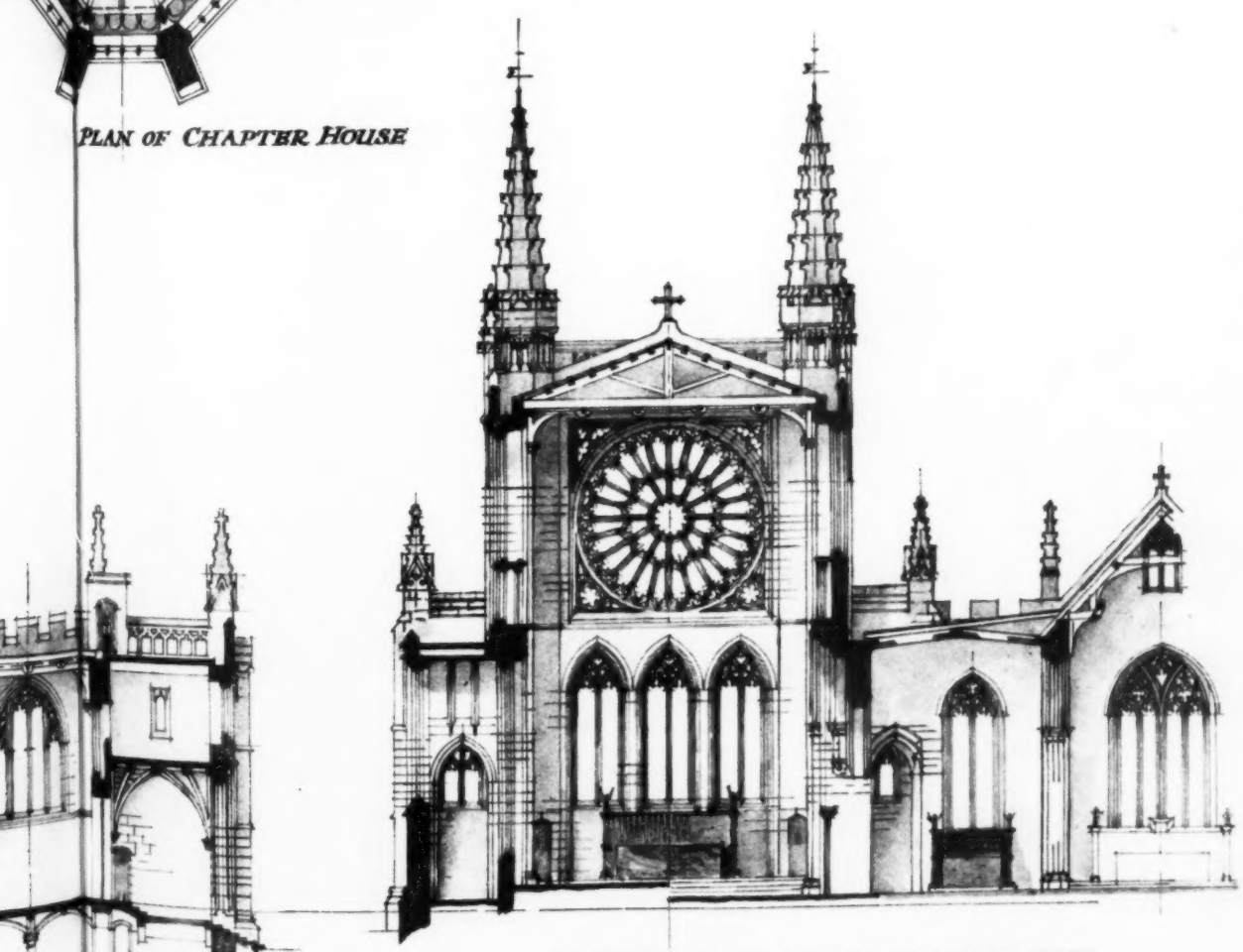
CROSS SECTION THROUGH NAVE LOOKING WEST

PLAN

SIR CHARLES A. NICHOLSON, BART., F.R.I.B



PLAN OF CHAPTER HOUSE



CROSS SECTION THROUGH QUIRE LOOKING EAST